

SOLICITATION, OFFER AND AWARD			1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)		RATING	PAGE OF PAGES 1 43	
2. CONTRACT NO.		3. SOLICITATION NO. N65540-05-R-0003		4. TYPE OF SOLICITATION [] SEALED BID (IFB) [X] NEGOTIATED (RFP)	5. DATE ISSUED 03 Jan 2005		6. REQUISITION/PURCHASE NO.
7. ISSUED BY NAVAL SURFACE WARFARE CENTER, CARDEROCK CODE 3352, ANNMARIE BARTHOLOMEO 5001 SOUTH BROAD ST PHILADELPHIA PA 19112-1403 TEL: 215-897-1649 FAX: 215-897-7994				CODE N65540		8. ADDRESS OFFER TO (If other than Item 7) CODE See Item 7 TEL: FAX:	
NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".							
SOLICITATION							
9. Sealed offers in original and <u>2</u> copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in <u>Block 7 above</u> until <u>01:30 PM</u> local time <u>08 Feb 2005</u> (Hour) (Date)							
CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.							
10. FOR INFORMATION CALL:		A. NAME ANNMARIE BARTHOLOMEO		B. TELEPHONE (Include area code) (NO COLLECT CALLS) 215-897-1649		C. E-MAIL ADDRESS BartholomeoA@nswccd.navy.mil	
11. TABLE OF CONTENTS							
(X)	SEC.	DESCRIPTION		PAGE(S)	(X)	SEC.	DESCRIPTION
PART I - THE SCHEDULE					PART II - CONTRACT CLAUSES		
X	A	SOLICITATION/ CONTRACT FORM		1	X	I	CONTRACT CLAUSES
X	B	SUPPLIES OR SERVICES AND PRICES/ COSTS		2 - 4	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS		
X	C	DESCRIPTION/ SPECS./ WORK STATEMENT		5	X	J	LIST OF ATTACHMENTS
	D	PACKAGING AND MARKING			PART IV - REPRESENTATIONS AND INSTRUCTIONS		
X	E	INSPECTION AND ACCEPTANCE		6	X	K	REPRESENTATIONS, CERTIFICATIONS AND
X	F	DELIVERIES OR PERFORMANCE		7 - 8			OTHER STATEMENTS OF OFFERORS
X	G	CONTRACT ADMINISTRATION DATA		9	X	L	INSTRS., CONDS., AND NOTICES TO OFFERORS
	H	SPECIAL CONTRACT REQUIREMENTS			X	M	EVALUATION FACTORS FOR AWARD
							23
							24 - 34
							35 - 40
							41 - 43
OFFER (Must be fully completed by offeror)							
NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.							
12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.							
13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52.232-8)							
14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated):				AMENDMENT NO.		DATE	
15A. NAME AND ADDRESS OF OFFEROR		CODE		FACILITY		16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	
15B. TELEPHONE NO (Include area code)		15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE. <input type="checkbox"/>		17. SIGNATURE		18. OFFER DATE	
AWARD (To be completed by Government)							
19. ACCEPTED AS TO ITEMS NUMBERED		20. AMOUNT		21. ACCOUNTING AND APPROPRIATION			
22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304(c)() <input type="checkbox"/> 41 U.S.C. 253(c)()				23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)		ITEM	
24. ADMINISTERED BY (If other than Item 7)		CODE		25. PAYMENT WILL BE MADE BY		CODE	
26. NAME OF CONTRACTING OFFICER (Type or print) TEL: EMAIL:				27. UNITED STATES OF AMERICA (Signature of Contracting Officer)		28. AWARD DATE	

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

Section B - Supplies or Services and Prices

This is a Indefinite Delivery/Indefinite Quantity contract.

ITEM NO	SUPPLIES/SERVICES	EST QTY	UNIT	UNIT PRICE	EST AMT
0001	1,200 Gallon per Day, Reverse Osmosis Units IAW PPD 802-7379413				
0001AA	First Article Testing – to include Unit Testing and Rehab Costs of the tested units NOTE: First Article Test Report to be submitted 45 days after First Article Testing completed but not later than 42 weeks after delivery order is awarded.	2	EA	\$_____	\$_____
0001AB	Production Units Same as 0001	14	EA	\$_____	\$_____
0001AC \$_____	Production Units Same as 0001 Orders placed in CY05	2	EA	\$_____	
0001AD	Production Units Same as 0001 Orders placed in CY06	4	EA	\$_____	\$_____
0001AE	Production Units Same as 0001 Orders placed in CY07	4	EA	\$_____	\$_____
0001AF	Production Units Same as 0001 Orders placed in CY08	4	EA	\$_____	\$_____
0001AG	Production Units	2	EA	\$_____	\$_____

Same as 0001

Orders placed in CY09

0001AH	Technical Manuals for Item 0001, Reverse Osmosis Unit IAW DD Form 1423, Seq. No. A012 and A031	1	LOT	NSP	NSP
0001AI	Provisioning Data for Item 0001, Reverse Osmosis Unit IAW DD Form 1423, Seq. No. A013 – A016	1	LOT	NSP	NSP
0001AJ	Technical Data for Item 0001, Reverse Osmosis Unit IAW DD Form 1423, Seq. No. A001 – A011, A017 – A030	1	LOT	NSP	NSP

***NSP: Not Separately Priced**

CONTRACT MINIMUM/MAXIMUM QUANTITY AND CONTRACT VALUE

The minimum quantity and contract value for all orders issued against this contract shall not be less than the minimum quantity and contract value stated in the following table. The maximum quantity and contract value for all orders issued against this contract shall not exceed the maximum quantity and contract value stated in the following table.

MINIMUM QUANTITY	MAXIMUM QUANTITY
1.00	31

CLIN DELIVERY/TASK ORDER MINIMUM/MAXIMUM QUANTITY AND CLIN ORDER VALUE

The minimum quantity and order value for the given Delivery/Task Order issued for this CLIN shall not be less than the minimum quantity and order value stated in the following table. The maximum quantity and order value for the given Delivery/Task Order issued for this CLIN shall not exceed the maximum quantity and order value stated in the following table.

CLIN	MINIMUM QUANTITY	MAXIMUM QUANTITY
0001	1.00	31

Section C - Descriptions and Specifications

SECTION C

Section C can be found as an attachment to Section J

Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	Naval Surface Warfare Center, Philadelphia, PA	Rich Steck Code 9232	Naval Surface Warfare Center, Philadelphia, PA	Rich Steck Code 9232

CLAUSES INCORPORATED BY REFERENCE

52.246-2	Inspection Of Supplies--Fixed Price	AUG 1996
52.246-11	Higher-Level Contract Quality Requirement	FEB 1999
52.246-16	Responsibility For Supplies	APR 1984
252.246-7000	Material Inspection And Receiving Report	MAR 2003

Section F - Deliveries or Performance

SHIP TO

Naval Warfare Center, Carderock Division
 Philadelphia Business Center
 1601 Langley Ave.
 Philadelphia, PA 19112

ATTN: Richard Steck/Code 9232
 215.897.7912

CLAUSES INCORPORATED BY REFERENCE

52.211-17	Delivery of Excess Quantities	SEP 1989
52.242-15	Stop-Work Order	AUG 1989
52.242-17	Government Delay Of Work	APR 1984
52.247-34	F.O.B. Destination	NOV 1991

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52.211-8 TIME OF DELIVERY (JUN 1997)

(a) The Government requires delivery to be made according to the following schedule:

REQUIRED DELIVERY SCHEDULE

0001AA: 160 days after delivery order award (contract award)

0001AB: 7 Units within 120 days after acceptance of First Article Testing
 7 Units within 180 days after acceptance of First Article Testing
 14 Total

0001AC through AG; 120 days after delivery order award.

0001AH - (for each unit under 0001AB). Ship with each unit in accordance with schedule under 0001AB above
 (for each unit under 0001AC through AG orders) 120 days after delivery order award - Ship
 with each unit

0001AI: 160 days after contract award.

0001AJ: IAW DD Form 1423.

The Government will evaluate equally, as regards time of delivery, offers that propose delivery of each quantity within the applicable delivery period specified above. Offers that propose delivery that will not clearly fall within the applicable required delivery period specified above, will be considered nonresponsive and rejected. The Government reserves the right to award under either the required delivery schedule or the proposed delivery

schedule, when an offeror offers an earlier delivery schedule than required above. If the offeror proposes no other delivery schedule, the required delivery schedule above will apply.

OFFEROR'S PROPOSED DELIVERY SCHEDULE

0001AA:

0001AB:

0001AC through AG:

0001AH

0001AI

0001AJ

(b) Attention is directed to the Contract Award provision of the solicitation that provides that a written award or acceptance of offer mailed, or otherwise furnished to the successful offeror, results in a binding contract. The Government will mail or otherwise furnish to the offeror an award or notice of award not later than the day award is dated. Therefore, the offeror should compute the time available for performance beginning with the actual date of award, rather than the date the written notice of award is received from the Contracting Officer through the ordinary mails. However, the Government will evaluate an offer that proposes delivery based on the Contractor's date of receipt of the contract or notice of award by adding (1) five calendar days for delivery of the award through the ordinary mails, or (2) one working day if the solicitation states that the contract or notice of award will be transmitted electronically. (The term "working day" excludes weekends and U.S. Federal holidays.) If, as so computed, the offered delivery date is later than the required delivery date, the offer will be considered nonresponsive and rejected.

Section G - Contract Administration Data

CLAUSES INCORPORATED BY REFERENCE

252.242-7000

Postaward Conference

DEC 1991

CLAUSES INCORPORATED BY FULL TEXT

CAR-G02 SUBMISSION OF INVOICES (FIXED PRICE) (MAR 2004)

(a) "Invoice" as used in this clause does not include contractor requests for progress payments.

(b) The contractor shall submit original invoices with copies to the address identified in the solicitation/contract award form (SF 26-Block 10; SF 33-Block 23; SF 1447-Block 14), unless delivery/task orders are applicable, in which case invoices will be segregated by individual order and submitted to the address specified in the order (DD 1155-Block 13 or SF 26-Block 10).

(c) The use of copies of the Material Inspection and Receiving Report (MIRR), DD Form 250, as an invoice is encouraged. DFARS Appendix F-306 provides instructions for such use. Copies of the MIRR used as an invoice are in addition to the standard distribution stated in DFARS F-401.

(d) In addition to the requirements of the Prompt Payment clause of this contract, the contractor shall cite on each invoice the contract line item number (CLIN); the contract subline item number (SLIN), if applicable; the accounting classification reference number (ACRN) as identified on the financial accounting data sheets, and the payment terms.

(e) The contractor shall prepare:

 X a separate invoice for each activity designated to receive the supplies or services.

 a consolidated invoice covering all shipments delivered under an individual order.

 either of the above.

(f) If acceptance is at origin, the contractor shall submit the MIRR or other acceptance verification directly to the designated payment office. If acceptance is at destination, the consignee will forward acceptance verification to the designated payment office

* Check applicable procedure.

(End of clause)

Section I - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUL 2004
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	APR 1984
52.203-6	Restrictions On Subcontractor Sales To The Government	JUL 1995
52.203-7	Anti-Kickback Procedures	JUL 1995
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	JAN 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	JAN 1997
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	JUN 2003
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.204-7	Central Contractor Registration	OCT 2003
52.209-3	First Article Approval--Contractor Testing	SEP 1989
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	JUL 1995
52.211-5	Material Requirements	AUG 2000
52.215-2	Audit and Records--Negotiation	JUN 1999
52.215-8	Order of Precedence--Uniform Contract Format	OCT 1997
52.215-11	Price Reduction for Defective Cost or Pricing Data--Modifications	OCT 1997
52.215-13	Subcontractor Cost or Pricing Data--Modifications	OCT 1997
52.215-14	Integrity of Unit Prices	OCT 1997
52.215-21	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications	OCT 1997
52.216-4	Economic Price Adjustment-Labor and Material	JAN 1997
52.219-8	Utilization of Small Business Concerns	MAY 2004
52.219-9	Small Business Subcontracting Plan	JAN 2002
52.219-16	Liquidated Damages-Subcontracting Plan	JAN 1999
52.219-21	Small Business Size Representation For Targeted Industry Categories Under The Small Business Competitiveness Demonstration Program	MAY 1999
52.222-3	Convict Labor	JUN 2003
52.222-19	Child Labor -- Cooperation with Authorities and Remedies	JUN 2004
52.222-20	Walsh-Healey Public Contracts Act	DEC 1996
52.222-21	Prohibition Of Segregated Facilities	FEB 1999
52.222-26	Equal Opportunity	APR 2002
52.222-35	Equal Opportunity For Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans	DEC 2001
52.222-36	Affirmative Action For Workers With Disabilities	JUN 1998
52.222-37	Employment Reports On Special Disabled Veterans, Veterans Of The Vietnam Era, and Other Eligible Veterans	DEC 2001
52.223-6	Drug-Free Workplace	MAY 2001
52.223-14	Toxic Chemical Release Reporting	AUG 2003
52.225-13	Restrictions on Certain Foreign Purchases	DEC 2003
52.227-1	Authorization and Consent	JUL 1995
52.227-2	Notice And Assistance Regarding Patent And Copyright Infringement	AUG 1996

52.229-3	Federal, State And Local Taxes	APR 2003
52.232-1	Payments	APR 1984
52.232-8	Discounts For Prompt Payment	FEB 2002
52.232-9	Limitation On Withholding Of Payments	APR 1984
52.232-11	Extras	APR 1984
52.232-23 Alt I	Assignment of Claims (Jan 1986) - Alternate I	APR 1984
52.232-25	Prompt Payment	OCT 2003
52.233-1	Disputes	JUL 2002
52.233-3	Protest After Award	AUG 1996
52.233-4	Applicable Law for Breach of Contract Claim	OCT 2004
52.242-13	Bankruptcy	JUL 1995
52.243-1	Changes--Fixed Price	AUG 1987
52.244-5	Competition In Subcontracting	DEC 1996
52.246-1	Contractor Inspection Requirements	APR 1984
52.246-23	Limitation Of Liability	FEB 1997
52.249-2	Termination For Convenience Of The Government (Fixed-Price)	MAY 2004
52.249-8	Default (Fixed-Price Supply & Service)	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	MAR 1999
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7004 Alt A	Required Central Contractor Registration Alternate A	NOV 2003
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	MAR 1998
252.211-7003	Item Identification and Valuation	JAN 2004
252.215-7000	Pricing Adjustments	DEC 1991
252.219-7003	Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (DOD Contracts)	APR 1996
252.223-7004	Drug Free Work Force	SEP 1988
252.225-7001	Buy American Act And Balance Of Payments Program	APR 2003
252.225-7002	Qualifying Country Sources As Subcontractors	APR 2003
252.225-7012	Preference For Certain Domestic Commodities	JUN 2004
252.225-7013	Duty-Free Entry	JAN 2004
252.225-7016 Alt I	Restriction on Acquisition of Ball and Roller Bearings (May 2004) Alternate I	APR 2003
252.225-7021	Trade Agreements	JUN 2004
252.227-7011	Assignments	AUG 1984
252.227-7013	Rights in Technical Data--Noncommercial Items	NOV 1995
252.232-7003	Electronic Submission of Payment Requests	JAN 2004
252.243-7001	Pricing Of Contract Modifications	DEC 1991
252.243-7002	Requests for Equitable Adjustment	MAR 1998
252.247-7023	Transportation of Supplies by Sea	MAY 2002

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52.216-18 ORDERING. (OCT 1995)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from **on/about 17**

June 2005 through on/about 17 June 2010.

(b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.

(c) If mailed, a delivery order or task order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

52.216-19 ORDER LIMITATIONS. (OCT 1995)

(a) Minimum order. When the Government requires supplies or services covered by this contract in an amount of one unit, the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) Maximum order. The Contractor is not obligated to honor:

(1) Any order for a single item in excess of 31 units);

(2) Any order for a combination of items in excess of 31 units; or

(3) A series of orders from the same ordering office within 10 days that together call for quantities exceeding the limitation in subparagraph (1) or (2) above.

(c) If this is a requirements contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR)), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) above.

(d) Notwithstanding paragraphs (b) and (c) above, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order (or orders) is returned to the ordering office within 10 days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

52.216-22 INDEFINITE QUANTITY. (OCT 1995)

(a) This is an indefinite-quantity contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum". The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum".

(c) Except for any limitations on quantities in the Order Limitations clause or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after **30 May 2010**.

52.223-11 OZONE-DEPLETING SUBSTANCES (MAY 2001)

(a) Definition. Ozone-depleting substance, as used in this clause, means any substance the Environmental Protection Agency designates in 40 CFR part 82 as--

(1) Class I, including, but not limited to, chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or

(2) Class II, including, but not limited to, hydrochlorofluorocarbons.

(b) The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR Part 82, Subpart E, as follows:

“WARNING: Contains (or manufactured with, if applicable), a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere.”-----

The Contractor shall insert the name of the substance(s).

(End of clause4)

52.248-1 VALUE ENGINEERING (FEB 2000)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any net acquisition savings realized from accepted VECP's, in accordance with the incentive sharing rates in paragraph (f) below.

(b) Definitions. "Acquisition savings," as used in this clause, means savings resulting from the application of a VECP to contracts awarded by the same contracting office or its successor for essentially the same unit. Acquisition savings include--

(1) Instant contract savings, which are the net cost reductions on this, the instant contract, and which are equal to the instant unit cost reduction multiplied by the number of instant contract units affected by the VECP, less the Contractor's allowable development and implementation costs;

(2) Concurrent contract savings, which are net reductions in the prices of other contracts that are definitized and ongoing at the time the VECP is accepted; and

(3) Future contract savings, which are the product of the future unit cost reduction multiplied by the number of future contract units in the sharing base. On an instant contract, future contract savings include savings on increases in quantities after VECP acceptance that are due to contract modifications, exercise of options, additional orders, and funding of subsequent year requirements on a multiyear contract.

"Collateral costs," as used in this clause, means agency cost of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contracting office" includes any contracting office that the acquisition is transferred to, such as another branch of the agency or another agency's office that is performing a joint acquisition action.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Future unit cost reduction," as used in this clause, means the instant unit cost reduction adjusted as the Contracting Officer considers necessary for projected learning or changes in quantity during the sharing period. It is calculated at the time the VECP is accepted and applies either (1) throughout the sharing period, unless the Contracting Officer decides that recalculation is necessary because conditions are significantly different from those previously anticipated or (2) to the calculation of a lump-sum payment, which cannot later be revised.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistics support. The term does not include the normal administrative costs of processing the VECP or any increase in this contract's cost or price resulting from negative instant contract savings.

"Instant contract," as used in this clause, means this contract, under which the VECP is submitted. It does not include increases in quantities after acceptance of the VECP that are due to contract modifications, exercise of options, or additional orders. If this is a multiyear contract, the term does not include quantities funded after VECP acceptance. If this contract is a fixed-price contract with prospective price redetermination, the term refers to the period for which firm prices have been established.

"Instant unit cost reduction" means the amount of the decrease in unit cost of performance (without deducting any Contractor's development or implementation costs) resulting from using the VECP on this, the instant contract. If this is a service contract, the instant unit cost reduction is normally equal to the number of hours per line-item task saved by using the VECP on this contract, multiplied by the appropriate contract labor rate.

"Negative instant contract savings" means the increase in the cost or price of this contract when the acceptance of a VECP results in an excess of the Contractor's allowable development and implementation costs over the product of the instant unit cost reduction multiplied by the number of instant contract units affected.

"Net acquisition savings" means total acquisition savings, including instant, concurrent, and future contract savings, less Government costs.

"Sharing base," as used in this clause, means the number of affected end items on contracts of the contracting office accepting the VECP.

Sharing period, as used in this clause, means the period beginning with acceptance of the first unit incorporating the VECP and ending at a calendar date or event determined by the contracting officer for each VECP.

"Unit," as used in this clause, means the item or task to which the Contracting Officer and the Contractor agree the VECP applies.

"Value engineering change proposal (VECP)" means a proposal that--

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the overall projected cost to the agency without impairing essential functions or characteristics; provided, that it does not involve a change--

(i) In deliverable end item quantities only;

(ii) In research and development (R&D) end items or R&D test quantities that is due solely to results of previous testing under this contract; or

(iii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (8) below. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and the proposed requirement, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, the effect of the change on the end item's performance, and any pertinent objective test data.

(2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) Identification of the unit to which the VECP applies.

(4) A separate, detailed cost estimate for (i) the affected portions of the existing contract requirement and (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under the Subcontracts paragraph of this clause, below.

(5) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(6) A prediction of any effects the proposed change would have on collateral costs to the agency.

(7) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(8) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submission. The Contractor shall submit VECP's to the Contracting Officer, unless this contract states otherwise. If this contract is administered by other than the contracting office, the Contractor shall submit a copy of the VECP simultaneously to the Contracting Officer and to the Administrative Contracting Officer.

(e) Government action. (1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it shall not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause and made either before or within a reasonable time after contract performance is completed. Until such a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing rates. If a VECP is accepted, the Contractor shall share in net acquisition savings according to the percentages shown in the table below. The percentage paid the Contractor depends upon (1) this contract's type (fixed-price, incentive, or cost-reimbursement), (2) the sharing arrangement specified in paragraph (a) above (incentive, program requirement, or a combination as delineated in the Schedule), and (3) the source of the savings (the instant contract, or concurrent and future contracts), as follows:

CONTRACTOR'S SHARE OF NET ACQUISITION SAVINGS

(Figures in percent)

Contract Type	Incentive (Voluntary)		Program Requirement (Mandatory)	
	Instant Contract Rate	Concurrent and Future Contract Rate	Instant Contract Rate	Concurrent and Future Contract Rate
Fixed-price (includes fixed-price-award-fee; excludes other fixed-price incentive contracts)	(1) 50	(1) 50	(1) 25	25
Incentive (fixed-price or cost) (other than award fee)	(2)	(1) 50	(2)	25
Cost-reimbursement (includes cost-plus-award-fee; excludes other cost-type incentive Contracts)	(3) 25	(3) 25	15	15

(1) The Contracting Officer may increase the Contractor's sharing rate to as high as 75 percent for each VECP.

(2) Same sharing arrangement as the contract's profit or fee adjustment formula.

(3) The Contracting Officer may increase the Contractor's sharing rate to as high as 50 percent for each VECP.

(g) Calculating net acquisition savings.

(1) Acquisition savings are realized when (i) the cost or price is reduced on the instant contract, (ii) reductions are negotiated in concurrent contracts, (iii) future contracts are awarded, or (iv) agreement is reached on a lump-sum payment for future contract savings (see subparagraph (i)(4) below). Net acquisition savings are first realized, and the Contractor shall be paid a share, when Government costs and any negative instant contract savings have been fully offset against acquisition savings.

(2) Except in incentive contracts, Government costs and any price or cost increases resulting from negative instant contract savings shall be offset against acquisition savings each time such savings are realized until they are fully offset. Then, the Contractor's share is calculated by multiplying net acquisition savings by the appropriate Contractor's percentage sharing rate (see paragraph (f) above). Additional Contractor shares of net acquisition savings shall be paid to the Contractor at the time realized.

(3) If this is an incentive contract, recovery of Government costs on the instant contract shall be deferred and offset against concurrent and future contract savings. The Contractor shall share through the contract incentive structure in savings on the instant contract items affected. Any negative instant contract savings shall be added to the target cost or to the target price and ceiling price, and the amount shall be offset against concurrent and future contract savings.

(4) If the Government does not receive and accept all items on which it paid the Contractor's share, the Contractor shall reimburse the Government for the proportionate share of these payments.

(h) Contract adjustment. The modification accepting the VECP (or a subsequent modification issued as soon as possible after any negotiations are completed) shall--

(1) Reduce the contract price or estimated cost by the amount of instant contract savings, unless this is an incentive contract;

(2) When the amount of instant contract savings is negative, increase the contract price, target price and ceiling price, target cost, or estimated cost by that amount;

(3) Specify the Contractor's dollar share per unit on future contracts, or provide the lump-sum payment;

(4) Specify the amount of any Government costs or negative instant contract savings to be offset in determining net acquisition savings realized from concurrent or future contract savings; and

(5) Provide the Contractor's share of any net acquisition savings under the instant contract in accordance with the following:

(i) Fixed-price contracts--add to contract price.

(ii) Cost-reimbursement contracts--add to contract fee.

(i) Concurrent and future contract savings.

(1) Payments of the Contractor's share of concurrent and future contract savings shall be made by a modification to the instant contract in accordance with subparagraph (h)(5) above. For incentive contracts, shares shall be added as a separate firm-fixed-price line item on the instant contract. The Contractor shall maintain records adequate to identify the first delivered unit for 3 years after final payment under this contract.

(2) The Contracting Officer shall calculate the Contractor's share of concurrent contract savings by (i) subtracting from the reduction in price negotiated on the concurrent contract any Government costs or negative instant contract savings not yet offset and (ii) multiplying the result by the Contractor's sharing rate.

(3) The Contracting Officer shall calculate the Contractor's share of future contract savings by (i) multiplying the future unit cost reduction by the number of future contract units scheduled for delivery during the sharing period, (ii) subtracting any Government costs or negative instant contract savings not yet offset, and (iii) multiplying the result by the Contractor's sharing rate.

(4) When the Government wishes and the Contractor agrees, the Contractor's share of future contract savings may be paid in a single lump sum rather than in a series of payments over time as future contracts are awarded. Under this alternate procedure, the future contract savings may be calculated when the VECP is accepted, on the basis of the Contracting Officer's forecast of the number of units that will be delivered during the sharing period. The Contractor's share shall be included in a modification to this contract (see subparagraph (h)(3) above) and shall not be subject to subsequent adjustment.

(5) Alternate no-cost settlement method. When, in accordance with subsection 48.104-4 of the Federal Acquisition Regulation, the Government and the Contractor mutually agree to use the no-cost settlement method, the following applies:

(i) The Contractor will keep all the savings on the instant contract and on its concurrent contracts only.

(ii) The Government will keep all the savings resulting from concurrent contracts placed on other sources, savings from all future contracts, and all collateral savings.

(j) Collateral savings. If a VECP is accepted, the Contracting Officer will increase the instant contract amount, as specified in paragraph (h)(5) of this clause, by a rate from 20 to 100 percent, as determined by the Contracting Officer, of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor's share of collateral savings will not exceed the contract's firm-fixed-price, target price, target cost, or estimated cost, at the time the VECP is accepted, or \$100,000, whichever is greater. The Contracting Officer will be the sole determiner of the amount of collateral savings.

(k) Relationship to other incentives. Only those benefits of an accepted VECP not rewardable under performance, design-to-cost (production unit cost, operating and support costs, reliability and maintainability), or similar incentives shall be rewarded under this clause. However, the targets of such incentives affected by the VECP shall not be adjusted because of VECP acceptance. If this contract specifies targets but provides no incentive to surpass them, the value engineering sharing shall apply only to the amount of achievement better than target.

(l) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of \$100,000 or more and may include one in subcontracts of lesser value. In calculating any adjustment in this contract's price for instant contract savings (or negative instant contract savings), the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs, and any value engineering incentive payments to a subcontractor, clearly resulting from a VECP accepted by the Government under this contract. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that the payments shall not reduce the Government's share of concurrent or future contract savings or collateral savings.

(m) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering clause of contract , shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of clause)

52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any **DFARS** clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAY 2002) ALTERNATE III (MAY 2002)

(a) Definitions. As used in this clause --

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DoD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

- (b)(1) The Contractor shall use U.S.-flag vessels when transporting any supplies by sea under this contract.
- (2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessels if--
- (i) This contract is a construction contract; or
- (ii) The supplies being transported are--
- (A) Noncommercial items; or
- (B) Commercial items that--
- (1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it contracts for f.o.b. destination shipment);
- (2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or
- (3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.
- (c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that --
- (1) U.S.-flag vessels are not available for timely shipment;
- (2) The freight charges are inordinately excessive or unreasonable; or
- (3) Freight charges are higher than charges to private persons for transportation of like goods.
- (d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum --
- (1) Type, weight, and cube of cargo;
- (2) Required shipping date;
- (3) Special handling and discharge requirements;
- (4) Loading and discharge points;
- (5) Name of shipper and consignee;
- (6) Prime contract number; and
- (7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Maritime Administration, Office of Cargo Preference, U.S. Department of Transportation, 400 Seventh Street SW., Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information:

- (1) Prime contract number;
- (2) Name of vessel;
- (3) Vessel flag of registry;
- (4) Date of loading;
- (5) Port of loading;
- (6) Port of final discharge;
- (7) Description of commodity;
- (8) Gross weight in pounds and cubic feet if available;
- (9) Total ocean freight in U.S. dollars; and
- (10) Name of the steamship company.

(f) The Contractor shall insert the substance of this clause, including this paragraph (f), in subcontracts that are for a type of supplies described in paragraph (b)(2) of this clause.

(End of clause)

CAR-I06 WRITTEN ORDERS (INDEFINITE DELIVERY CONTRACTS) (JUN 1996)(NSWCCD)

Written orders (on DD Form 1155) will contain the following information consistent with the terms of the contract:

- (a) Date of order
- (b) Contract number and order number.
- (c) Item number and description, quantity ordered, unit price and contract price.
- (d) Delivery or performance date.
- (e) Place of delivery or performing (including consignee).
- (f) Packaging, packing, and shipping instructions if any required.
- (g) Accounting and appropriation data.
- (h) Inspection invoicing and payment provisions to the extent not covered in the contract; and any other pertinent information.

CAR-I10 AUTHORIZED CHANGES ONLY BY THE CONTRACTING OFFICER (JUN 1996) (NSWCCD)

(a) Except as specified in paragraph (b) below, no order, statement, or conduct of Government personnel who visit the Contractor's facilities or in any other manner communicates with Contractor personnel during the performance of this contract shall constitute a change under the "Changes" clause of this contract.

(b) The Contractor shall not comply with any order, direction or request of Government personnel unless it is issued in writing and signed by the Contracting Officer, or is pursuant to specific authority otherwise included as a part of this contract.

(c) The Contracting Officer is the only person authorized to approve changes in any of the requirements of this contract and notwithstanding provisions contained elsewhere in this contract, the said authority remains solely the Contracting Officer's. In the event the contractor effects any change at the direction of any person other than the Contracting Officer, the change will be considered to have been made without authority and no adjustment will be made in the contract price to cover any increase in charges incurred as a result thereof. The address and telephone number of the Contracting Officer is:

Mr. Robert Colot, Code 3352
Naval Surface Warfare Center, Carderock Division
5001 S. Broad Street
Philadelphia, PA 19112
215.897.7060

Section J - List of Documents, Exhibits and Other Attachments

SECTION J

Attachment 1 – Section C Description/Specifications/Work Statement entitled Statement of Work
Dec 2004 NAVSEA No. 802-7379413, 1,200 Gallon Per Day Reverse Osmosis
(RO) Desalination Unit

Attachment 2 – Contract Data Requirements List (DD 1423) A001 through A031

Section K - Representations, Certifications and Other Statements of Offerors

CLAUSES INCORPORATED BY REFERENCE

52.203-11	Certification And Disclosure Regarding Payments To Influence Certain Federal Transactions	APR 1991
52.222-38	Compliance With Veterans' Employment Reporting Requirements	DEC 2001
252.209-7001	Disclosure of Ownership or Control by the Government of a Terrorist Country	SEP 2004
252.225-7003	Report of Intended Performance Outside the United States	APR 2003
252.225-7031	Secondary Arab Boycott Of Israel	APR 2003
252.227-7028	Technical Data or Computer Software Previously Delivered to the Government	JUN 1995

CLAUSES INCORPORATED BY FULL TEXT

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

“Common parent,” as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

“Taxpayer Identification Number (TIN),” as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

___ TIN:_____

___ TIN has been applied for.

___ TIN is not required because:

___ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

___ Offeror is an agency or instrumentality of a foreign government;

___ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

___ Sole proprietorship;

___ Partnership;

___ Corporate entity (not tax-exempt);

___ Corporate entity (tax-exempt);

___ Government entity (Federal, State, or local);

___ Foreign government;

___ International organization per 26 CFR 1.6049-4;

___ Other _____

(f) Common parent.

___ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

___ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it () is a women-owned business concern.

(End of provision)

52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that-

(i) The Offeror and/or any of its Principals-

(A) Are () are not () presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have () have not (), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are () are not () presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) The Offeror has () has not (), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

52.215-6 PLACE OF PERFORMANCE (OCT 1997)

(a) The offeror or respondent, in the performance of any contract resulting from this solicitation, () intends, () does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or respondent as indicated in this proposal or response to request for information.

(b) If the offeror or respondent checks "intends" in paragraph (a) of this provision, it shall insert in the following spaces the required information:

Place of Performance(Street Address, City, State, County, Zip Code)	Name and Address of Owner and Operator of the Plant or Facility if Other Than Offeror or Respondent

(End of provision)

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2004) - ALTERNATE I (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 333319.

(2) The small business size standard is 500 employees.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it () is, () is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it () is, () is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it () is, () is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it () is, () is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it () is, () is not a service-disabled veteran-owned small business concern.

(6) [Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents, as part of its offer, that--

(i) It () is, () is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material

change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It () is, () is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:_____.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) (Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.) The offeror shall check the category in which its ownership falls:

_____ Black American.

_____ Hispanic American.

_____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

_____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

_____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

_____ Individual/concern, other than one of the preceding.

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; or

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice.

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

52.219-22 SMALL DISADVANTAGED BUSINESS STATUS (OCT 1999)

(a) General. This provision is used to assess an offeror's small disadvantaged business status for the purpose of obtaining a benefit on this solicitation. Status as a small business and status as a small disadvantaged business for general statistical purposes is covered by the provision at FAR 52.219-1, Small Business Program Representation.

(b) Representations.

(1) General. The offeror represents, as part of its offer, that it is a small business under the size standard applicable to this acquisition; and either--

___ (i) It has received certification by the Small Business Administration as a small disadvantaged business concern consistent with 13 CFR 124, Subpart B; and

(A) No material change in disadvantaged ownership and control has occurred since its certification;

(B) Where the concern is owned by one or more disadvantaged individuals, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(C) It is identified, on the date of this representation, as a certified small disadvantaged business concern in the database maintained by the Small Business Administration(PROONet); or

____ (ii) It has submitted a completed application to the Small Business Administration or a Private Certifier to be certified as a small disadvantaged business concern in accordance with 13 CFR 124, Subpart B, and a decision on that application is pending, and that no material change in disadvantaged ownership and control has occurred since its application was submitted.

(2)____ For Joint Ventures. The offeror represents, as part of its offer, that it is a joint venture that complies with the requirements at 13 CFR 124.1002(f) and that the representation in paragraph (b)(1) of this provision is accurate for the small disadvantaged business concern that is participating in the joint venture. [The offeror shall enter the name of the small disadvantaged business concern that is participating in the joint venture: _____.]

(c) Penalties and Remedies. Anyone who misrepresents any aspects of the disadvantaged status of a concern for the purposes of securing a contract or subcontract shall:

- (1) Be punished by imposition of a fine, imprisonment, or both;
- (2) Be subject to administrative remedies, including suspension and debarment; and
- (3) Be ineligible for participation in programs conducted under the authority of the Small Business Act.

(End of provision)

52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that --

- (a) () It has, () has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;
- (b) () It has, () has not, filed all required compliance reports; and
- (c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

52.222-25 AFFIRMATIVE ACTION COMPLIANCE (APR 1984)

The offeror represents that

- (a) [] it has developed and has on file, [] has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or
- (b) [] has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(End of provision)

52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)

(a) Executive Order 13148, of April 21, 2000, Greening the Government through Leadership in Environmental Management, requires submission of this certification as a prerequisite for contract award.

(b) By signing this offer, the offeror certifies that--

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

() (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed in 40 CFR 372.65;

() (ii) The facility does not have 10 or more full-time employees as specified in section 313.(b)(1)(A) of EPCRA 42 U.S.C. 11023(b)(1)(A);

() (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

() (iv) The facility does not fall within the following Standard Industrial Classification (SIC) codes or their corresponding North American Industry Classification System sectors:

(A) Major group code 10 (except 1011, 1081, and 1094.

(B) Major group code 12 (except 1241).

(C) Major group codes 20 through 39.

(D) Industry code 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce).

(E) Industry code 4953 (limited to facilities regulated under the Resource Conservation and Recovery Act, Subtitle C (42 U.S.C. 6921, et seq.), 5169, 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis); or

() (v) The facility is not located within the United States or its outlying areas.

(End of clause)

52.226-2 HISTORICALLY BLACK COLLEGE OR UNIVERSITY AND MINORITY INSTITUTION REPRESENTATION (MAY 2001)

(a) Definitions. As used in this provision--

Historically black college or university means an institution determined by the Secretary of Education to meet the requirements of 34 CFR 608.2. For the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, the term also includes any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

Minority institution means an institution of higher education meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1067k, including a Hispanic-serving institution of higher education, as defined in Section 316(b)(1) of the Act (20 U.S.C. 1101a)).

(b) Representation. The offeror represents that it--

() is () is not a historically black college or university;

() is () is not a minority institution.

(End of provision)

252.225-7000 BUY AMERICAN ACT--BALANCE OF PAYMENTS PROGRAM CERTIFICATE (APR 2003)

(a) Definitions. Domestic end product, foreign end product, qualifying country, and qualifying country end product have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) Evaluation. The Government--

(1) Will evaluate offers in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement; and

(2) Will evaluate offers of qualifying country end products without regard to the restrictions of the Buy American Act or the Balance of Payments Program.

(c) Certifications and identification of country of origin.

(1) For all line items subject to the Buy American Act and Balance of Payments Program clause of this solicitation, the offeror certifies that--

(i) Each end product, except those listed in paragraph (c)(2) or (3) of this provision, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The offeror certifies that the following end products are qualifying country end products:

(Line Item Number Country of Origin)

(Country of Origin)

(3) The following end products are other foreign end products:

(Line Item Number)

(Country of Origin) (If known)

(End of provision)

252.225-7020 TRADE AGREEMENTS CERTIFICATE (JAN 2004)

(a) Definitions. Caribbean Basin country end product, designated country end product, Free Trade Agreement country end product, nondesignated country end product, qualifying country end product, and U.S. -made end product have the meanings given in the Trade Agreements clause of this solicitation.

(b) Evaluation. The Government--

(1) Will evaluate offers in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement; and

(2) Will consider only offers of end products that are U.S.-made, qualifying country, designated country, Caribbean Basin country, or Free Trade Agreement country end products, unless the Government determines that--

(i) There are no offers of such end products;

(ii) The offers of such end products are insufficient to fulfill the Government's requirements; or

(iii) A national interest exception to the Trade Agreements Act applies.

(c) Certification and identification of country of origin.

(1) For all line items subject to the Trade Agreements clause of this solicitation, the offeror certifies that each end product to be delivered under this contract, except those listed in paragraph (c)(2) of this provision, is a U.S.-made, qualifying country, designated country, Caribbean Basin country, or Free Trade Agreement country end product.

(2) The following supplies are other nondesignated country end products:

(Line Item Number)

(Country of Origin)

(End of provision)

252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term supplies is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) Representation. The Offeror represents that it:

____ (1) Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

____ (2) Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of provision)

CAR-K01 ELECTRONIC DISTRIBUTION OF CONTRACT DOCUMENTS (NOV 2000)

(a) The Navy Air Force Interface (NAFI) provides World Wide Web access to documents used to support the procurement, contract administration, bill paying, and accounting processes. NAFI is being used by the Naval Surface Warfare Center, Carderock Division to electronically distribute all contract award and contract modification documents, including task and delivery orders. The contractor's copy will be provided in portable document format (pdf) as an attachment to an e-mail that will be sent to the contractor by the NAFI system. A pdf file may be accessed using Adobe Acrobat Reader which is a free software that may be downloaded at <http://www.adobe.com/products/acrobat/readstep.html>.

(b) Offerors must provide the following information that will be used to make electronic distribution for any resultant contract.

Name of Point of Contact _____

Phone Number for Point of Contact _____

E-mail Address for Receipt of Electronic Distribution _____

Section L - Instructions, Conditions and Notices to Bidders

CLAUSES INCORPORATED BY REFERENCE

52.204-6	Data Universal Numbering System (DUNS) Number	OCT 2003
52.214-34	Submission Of Offers In The English Language	APR 1991
52.214-35	Submission Of Offers In U.S. Currency	APR 1991
52.215-1	Instructions to Offerors--Competitive Acquisition	JAN 2004
52.215-20	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data	OCT 1997
252.227-7017	Identification and Assertion of Use, Release, or Disclosure Restrictions	JUN 1995
252.227-7028	Technical Data or Computer Software Previously Delivered to the Government	JUN 1995

CLAUSES INCORPORATED BY FULL TEXT

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a firm fixed price, indefinite delivery/indefinite quantity contract resulting from this solicitation.

(End of clause)

52.233-2 SERVICE OF PROTEST (AUG 1996)

Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from:

Mr. Robert Colot , Contracting Officer
 Naval Surface Warfare Center, Code 3352
 Philadelphia Business Center
 5001 South Broad St.
 Philadelphia, PA 19112

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its

quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

www.arnet.gov

www.farsite.hill.af.mil

(End of provision)

52.252-5 AUTHORIZED DEVIATIONS IN PROVISIONS (APR 1984)

(a) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the provision.

(b) The use in this solicitation of any _____ (48 CFR Chapter _____) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of provision)

CAR-L02 SINGLE AWARD FOR ALL ITEMS (JUN 1996) (NSWCCD)

Due to the interrelationship of supplies and/or services to be provided hereunder, the Government reserves the right to make a single award to the offeror whose offer is considered in the best interest of the Government, price and other factors considered. Therefore, offerors proposing less than the entire effort specified herein may be determined to be unacceptable.

CAR-L11 PROPOSAL PREPARATION REQUIREMENT (JUL 2002) (NSWCCD)

It is requested that offerors prepare their proposals in accordance with the following organization, content and format requirements to assist the government in making a complete and thorough evaluation of all proposals. Proposals shall be submitted as three separate documents, as follows:

Documents	Original	Copies
Solicitation, Offer and Award Document (SF-33)	1	2
Technical Proposal	1	4
Cost Proposal	1	4

The "originals" shall be clearly identified as the "ORIGINAL", and bear the original signature(s) of the offeror. The "copies" shall be complete and clearly identified as "COPY" or "DUPLICATE".

In order to facilitate the evaluation process, it is requested that offerors also submit their cost proposal spreadsheets on diskette (in addition to the hard copy requirements stated above). Diskettes shall be in 3.5 inch, high density format, and it is requested that the spreadsheet files be compatible with Windows 95 Version 4.0, Excel 97 Version 8.0. The provision of these spreadsheet files on diskette in no way relinquishes the offeror's responsibility to provide hard copies of the cost proposal.

(1) SOLICITATION, OFFER AND AWARD DOCUMENTS (SF-33 RFP)

This document, which may be used as part of the contract award document, shall be fully executed and returned as a separate document from the technical and cost proposals. Special attention should be taken to accurately enter the prices required in Section B, complete all Representations and Certifications in Section K and ensure that an authorized person signs the offer in Block 17 of Page 1.

The document SHALL NOT be embellished with any cover or binding. If the offeror makes any qualifications to any provisions in the RFP, all such qualifications shall be listed in a cover letter to the proposal. Qualifications may also be annotated on the Solicitation, Offer and Award document, if such annotation is necessary to clarify the qualifications.

(2) TECHNICAL PROPOSAL

The technical/management proposal should be written so that management and engineering oriented personnel can make a thorough evaluation and arrive at a sound determination as to whether the proposal meets the requirements of this solicitation. To this end, the technical proposal shall be so specific, detailed and complete as to clearly and fully demonstrate that the prospective contractor has a thorough understanding of the technical requirements contained in Section C of this solicitation.

Statements such as "the offeror understands," "will comply with the statement of work," "standard procedures will be employed," "well known techniques will be used" and general paraphrasing of the statement of work are considered inadequate. The technical proposal must provide details concerning what the contractor will do and how it will be done. This includes a full explanation of the techniques, disciplines, and procedures proposed to be followed.

The technical proposal shall not contain any reference to cost; however, information concerning labor allocation and categories, consultants, travel, materials, equipment and any information of interest to technical reviewers shall be contained in the technical proposal in sufficient detail so that the offeror's understanding of the scope of the work may be adequately evaluated. The technical proposal shall be page numbered, contain a table of contents, be organized in the following four (4) sections, and shall address in detail the following information:

SECTION 1 - INTRODUCTION: This section shall provide any necessary background information and an overview of the proposal which the offeror believes will assist in the understanding and accurate evaluation of the proposal.

SECTION 2 - DESIGN AND PERFORMANCE CHARACTERISTICS: The offeror shall address the following technical elements for the proposed 1,200 Gallon Per Day (GPD) Reverse Osmosis (RO) Desalination unit:

- 4 *Detailed Requirement Compliance Matrix:* The proposal shall contain sufficient technical details and a compliance matrix to show how all of the technical requirements contained in Section 3, Detail Requirements, of the specification will be met. This matrix shall provide details on all of the components and control systems being offered. These technical details shall also list the entire proposed component materials and materials of construction.
- 5 *Performance Characteristics:* Preliminary calculations of the 1,200 Gallon Per Day (GPD) RO desalination unit performance and flow requirements, weight, and service life calculations for the reverse osmosis membrane pressure vessels. Reverse osmosis membrane performance projections shall be provided to demonstrate that the proposed membrane array will meet the performance requirements under the conditions defined in the specification.
- 6 *Ship Interface Design:* A general arrangement drawing and process and instrumentation diagram for the proposed 1,200 Gallon Per Day (GPD) RO desalination unit shall also be provided. The

general arrangement drawing shall indicate overall system and unit dimensions, maintenance accessibility, and ship interface requirements. The process and instrumentation diagram shall indicate expected flow rates and planned piping sizes and schedule. Describe the design risk, if any, in the proposed Reverse Osmosis (RO) Desalination unit.

By submitting its signed offer without taking any exceptions, the offeror will be indicating its intent to fully comply with the technical requirements. Offerors that request changes to any of the requirements terms and conditions or otherwise indicate other than full compliance, shall provide details and justification for the change. If an explanation is not provided, the offeror will be considered to be non-compliant and may be eliminated from consideration for award at any time prior to award, including elimination from the competitive range.

SECTION 3 - LIFE CYCLE MAINTENANCE COSTS: Provide the maintenance costs for 15 years of operation at 4,500 hours per year with a minimum of 54 starts. The maintenance information will include scheduled maintenance and scheduled 1,200 Gallon Per Day (GPD) RO unit component overhaul times with a projected service life of the RO unit pressure vessels. The scheduled maintenance information will include projected preventative/scheduled maintenance required to ensure the RO unit operates satisfactory. This shall include the estimated costs to maintain the pretreatment system, high-pressure pump (i.e. oil measurements and changes, alignment checks, plunger packing replacement, drive belt tension measurement, adjustment and replacement), checking de-surger pressure, and other required preventive or operational maintenance tasks. The frequency and duration of such maintenance shall be clearly defined. Data including mean time between failures, mean time to repair, and mean time for scheduled maintenance will be provided for the RO unit components. The life cycle cost schedule will indicate the material costs and labor hours required to maintain the RO unit over a 15-year period. The labor hours for maintenance tasks that can be accomplished by ships force will be listed separately from tasks that would be beyond the capability of ships force. The level of expertise need to accomplish tasks assigned to ships force shall be provided.

SECTION 4 - PAST PERFORMANCE; The past performance section shall include information about the offeror and proposed subcontractors, if applicable, according to the following instructions. The offeror shall list their five (5) most recent contracts and/or subcontracts, awarded for similar supplies, completed within the last three (3) years, and identify in specific detail for each why or how you consider that effort relevant or similar to the effort required by this solicitation. Contracts listed may include those entered into with the Federal Government, agencies of state and local governments, and commercial customers.

The following detailed information submitted for each of the five contracts:

- (1) Name of Customer (Federal Contracting Activity, Local Government, Commercial Customer, etc.)
- (2) Contract/Subcontract Number
- (3) Contract Type
- (4) Total Contract Value
- (5) Customer Point of Contact (List two names, phone numbers and a fax number)
- (6) Relevant or similar effort/description of product
- (7) Period of Performance

The offeror shall provide information on problems (show cause, cure notice, termination for default, quality issues, defective pricing issues, litigation etc.) encountered on these contracts and corrective actions taken to resolve those problems.

The following elements shall be addressed in narrative form:

(1) *Quality of Product.* Compliance with contract requirements, accuracy of reports, appropriateness of personnel, technical excellence.

(2) *Timeliness of Performance.* Met interim milestones, reliable, responsive to technical direction, completed on time.

(3) *Customer Satisfaction.* Satisfaction of end users with the contractor's service.

(4) *Quality Awards.* The offeror should describe any quality awards or certifications that indicate the offeror possesses a high quality process for developing and producing the product. Examples: Malcolm Baldrige Quality Award, Government Quality Awards and or private sector awards or certifications. Identify what segment of the company received the award or certification. Describe when the award or certification was bestowed. If the award or certification is over three years old, present evidence that the qualifications still apply.

(5) *Small Business Subcontracting Program.* The offeror shall describe the efforts and results achieved in pursuit of the offeror's responsibilities outlined in FAR 52.219-9, Small Business Subcontracting Plan. Those statistical results compared to established goals shall be presented listed for individual contracts or on an annual basis depending on the type of plan negotiated. Performance period shall be over the last three years from the issue date of the solicitation. Copies of required reports and evidence of results of special initiatives are acceptable. Other information or performance awards related to small business subcontracting efforts may be submitted as appropriate.

SECTION 5 - CORPORATE EXPERIENCE/RESOURCES: The offeror shall describe experience in designing and manufacturing desalination production systems used in navy or commercial marine shipboard applications. Navy or commercial marine shipboard applications are defined as any desalination system that is designed to be installed on an oceangoing naval, research or commercial ship. The offeror shall provide a listing of manufacturing, production, technical equipment, facilities, and other resources, or how they will be obtained for use in this contract and identify how they will be used to support fabrication of the RO unit and all the test requirements identified in the specification. The Offeror shall also provide a list and examples of its welding procedures for welding each of the materials planned to be used. The offerors welding procedures shall either meet the requirements of publications, NAVSEA S9074-AR-GIB-010/278 and S9074-AQ-GIB-010/248 or the offer shall provide a plan of action and milestones to meet these requirements and maintain the desired delivery schedule. The offeror shall also identify the welding certifications, and its associated updates, for each member of its welding staff, sufficient to indicate that each of its welders is qualified to weld the materials planned to be used. The offeror's welding certifications shall be current (i.e., the welder must have performed at least one weld for each of the materials that he or she is certified to weld. The offeror shall describe its quality or inspection system, processes and/or procedures that will be used to ensure compliance with the requirements contained in the specification. This will include the means, methods and controls to be employed during purchasing, manufacturing, production, assembly, testing and inspection of the producer.

SECTION 6 - LOGISTICS SUPPORT: The offeror shall clearly demonstrate the capability, capacity, and approach for meeting the requirements in the contract. This section of the proposal shall detail the planned fabrication

and test schedule to meet the required delivery date. Describe the ability to obtain and provide spare parts for the RO unit. Previous experience with Federal supply agencies shall be provided. RO unit component commonality with other navy or commercial marine applications shall be identified.

SECTION 7 - SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED BUSINESS, HISTORICALLY BLACK COLLEGES OR UNIVERSITIES AND MINORITY INSTITUTION AND VETERAN OWNED SUBCONTRACTING: Describe the extent to which such firms are specifically identified in the proposal and subcontracting plan, the extent of commitment to use such firms, the complexity and variety of the work such firms are to perform and the extent of participation of such firms in terms of the value of the total acquisition.

Incomplete data may not be considered.

Section M - Evaluation Factors for Award

CLAUSES INCORPORATED BY FULL TEXT

CAR-M02 EVALUATION OF PROPOSALS (OCT 2003) (NSWCCD)

(a) **General.** Careful, full and impartial consideration will be given to all offers received pursuant to this solicitation, and the evaluation will be applied in a similar manner. Factors against which offers will be evaluated (e.g., Technical Capability and Price) are set forth below and parallel the solicitation response called for elsewhere herein.

(b) **Initial Evaluation of Offers.** An evaluation plan has been established to evaluate offers pursuant to the factors set forth in (g) below and all offers received will be evaluated by a team of Government personnel in accordance with the plan. Offers will be evaluated on the basis of the best value to the Government. All evaluation factors other than cost or price, when combined, are significantly more important than cost or price.

(c) **Evaluation Approach.** The following evaluation approach will be used:

(1) *Technical Proposal.* The evaluators will prepare a narrative description and assign a point score for each technical evaluation factor. All evaluation factors other than cost or price will be combined into a merit rating of either acceptable, unacceptable but susceptible of being made acceptable, or unacceptable.

(2) *Price Proposal.* (i) Although price is not scored, numerically weighted, or combined with the other evaluation factors to establish a merit rating, it will be evaluated for magnitude and realism. The determination of the magnitude of the price proposal will be based on the total of all proposed costs. In those evaluations where all other evaluation factors, when combined, are significantly more important than cost or price, the degree of importance of the cost or price factor will increase with the degree of equality of the proposals in relation to the other factors on which selection is to be based.

(ii) Proposals which are unrealistic in terms of technical or schedule commitments or unrealistically high or low in cost may be deemed reflective of an inherent lack of technical competence, or indicative of a failure to comprehend the complexity and risks of the proposed work, and may be grounds for rejection of the proposal. If the proposed contract requires the delivery of data, the quality of organization and writing reflected in the proposal will be considered to be an indication of the quality of organization and writing which would be prevalent in the proposed deliverable data. Subjective judgment on the part of the Government evaluators is implicit in the entire process. Throughout the evaluation, the Government will consider "correction potential" when a deficiency is identified.

(d) **Competitive Acquisition Instructions.**

- (1) If the provision FAR 52.215-1, "Instructions To Offerors--Competitive Acquisition" is included in Section L of this solicitation, the Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. However, the Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary.
- (2) If the provision at FAR 52.215-1 is used with its Alternate I, the Government intends to evaluate proposals and award a contract after conducting discussions with offerors whose proposals have been determined to be in the competitive range.

- (3) In either of the above two situations, if the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(e) **Discussion/Final Proposal Revisions.** The Contracting Officer shall indicate to, or discuss with, each offeror still being considered for award, significant weaknesses, deficiencies, and other aspects of its proposal (such as price, technical approach, past performance, and terms and conditions) that could, in the opinion of the Contracting Officer, be altered or explained to enhance materially the proposal's potential for award. The scope and extent of discussions are a matter of Contracting Officer judgment. At the conclusion of discussions, each offeror still in the competitive range shall be given an opportunity to submit a final proposal revision. A final cut-off date for receipt of final proposal revisions will be established by the Contracting Officer.

(f) **Basis for Contract Award.** The basis for award of a contract(s) as a result of this solicitation will be an integrated assessment by the Contracting Officer of the results of the evaluation based on the evaluation factors and their importance as indicated below. The integrated assessment may include consideration of the strengths and weaknesses of the proposals, and, if deemed necessary by the Contracting Officer, consideration of various types of mathematical models comparing technical points and cost. Ultimately, the source selection decision will take into account the offeror's capability to meet the requirements of this solicitation on a timely and cost effective basis. The Government reserves such right of flexibility in conducting the evaluation as is necessary to assure placement of a contract in the Government's best interest. Accordingly, the Government may award any resulting contract to other than the lowest priced offeror, or other than the offeror with the highest evaluation rating.

- (1) The contract resulting from this solicitation will be awarded to that responsible offeror whose offer, conforming to the solicitation, is determined most advantageous to the Government, cost and other factors considered.
- (2) All evaluation factors other than cost or price, when combined, are significantly more important than cost or price

(g) **Evaluation Factors.** The evaluation factors and significant subfactors are listed below in both descending order and degree of relative importance.

A. Technical Factors

1. Design, and Performance Characteristics
 - a. Conformance with detailed requirements.
 - b. Performance.
 - c. Ship Interface and Maintainability.
2. Past Performance
 - a. Quality of Product including Quality Awards
 - b. Timeliness of Performance
 - c. Customer Satisfaction
 - d. Past performance in complying with requirements at FAR 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan
3. Life Cycle Maintenance Costs
 - a. Cost
 - b. Reliability

4. Corporate Experience/Resources
 - a. Naval Installations
 - b. Commercial Marine Installations
 - c. Facilities and Equipment
 - d. Quality Assurance
 - e. Welding

5. Logistics Support
 - a. Fabrication and Test Schedule
 - b. Spare Parts Availability
 - c. Commonality with Navy and Commercial Users

6. Small, Small Disadvantaged, Women-Owned and Veteran Owned Business and Historically Black Colleges or Universities and Minority Institution Subcontracting

- a. The extent to which such firms are specifically identified in the proposal and subcontracting plan
- b. The extent of commitment to use such firms
- c. The complexity and variety of the work such firms are to perform
- d. The extent of participation of such firms in terms of the value of the total acquisition

B. Price

STATEMENT OF WORK
DEC 2004

NAVSEA NO. 802-7379413

1,200 GALLON PER DAY
REVERSE OSMOSIS (RO)
DESALINATION UNIT

1.0 SCOPE

This Reverse Osmosis (RO) Desalination Unit is designed for the purpose of producing 1,200 gallons per day (GPD) of freshwater with a total dissolved solids level below 25 parts per million. This statement of work document provides the requirements for the RO desalination unit.

1.1 Technical Data Package

The Contractor shall use this statement of work document to produce the required First Article and all other production units.

1.2 First Article Testing

The first RO Unit ship set shall be fabricated for use in First Article Testing (see para. 4.3). The first RO unit ship set consists of two independent 1,200 GPD RO units.

1.3 Production

The Contractor shall begin design and fabrication of the First Article Unit ship set, from contract award. Once First Article Testing has been completed, and test reports accepted and approved by the Contracting Agency, the Contractor shall begin fabrication of the production units.

1.4 Critical Manufacturing Points (CMP)

Naval Surface Warfare Center (NSWC) or a NSWC designated agent will review and inspect ongoing manufacturing efforts at the critical points listed below during manufacture of the First Article as well as at any time during manufacture of the RO units.

Critical Manufacturing Points (CMP) are defined as:

- a. at a point during the initial development of the process and instrumentation and flow diagrams of the RO unit
- b. at a point where the process and instrumentation and flow diagrams are in final development and the initial list of components and materials of construction has been developed
- c. at a point where the detailed drawing development for the RO unit is approx. 50 percent complete, the process and instrumentation and flow diagrams are finalized, and the majority of the components have been selected
- d. at a point where the detailed drawing development for the RO unit is 100 percent complete, all the components have been selected, and prior to actual start of fabrication
- e. after unit fabrication is 75 percent complete
- f. after final assembly
- g. at the start of each of the first article tests
- h. at the final unit inspection following completion of all first article testing.

The Contractor shall notify NSWC one week prior to reaching the above CMPs.

2.0 APPLICABLE DOCUMENTS

2.1 General

The following documents shall form a part of this statement of work document to the extent specified herein.

2.2 Government Documents

2.2.1 Specifications, Standards, and Handbooks

The following specifications, standards, and handbooks form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-F-1183J dated 5 May 1987 - Fittings, Pipe, Cast Bronze, Silver Brazing, General Specification For

MIL-S-1222G with Amendment 3 dated 29 December 1980 - Studs, Bolts, Screws, Socket Head Cap Screws and Nuts

MIL-E-2036D dated 10 March 1988 - Enclosures for Electric and Electronic Equipment, Naval Shipboard

MIL-DTL-2212H dated 10 February 1997 - Contactors and Controllers, Electric Motor AC or DC, and Associated Switching Devices

MIL-PRF-2490D dated 13 April 1999 - Snubbers, Fluid Pressure, Instrument Protection

MIL-T-16420K with Amendment 1 dated 16 September 1988 - Tube, Copper Nickel Alloy, Seamless and Welded

MIL-I-17244E with Notice 1 dated 7 June 1991 - Indicators, Temperature, Direct Reading, Bimetallic, (3 and 5 Inch Dial)

MIL-PRF-20042E dated 16 September 1999 - Flanges, Pipe, Bronze, (Silver Brazing)

MIL-T-24270B dated 2 September 1983 - Thermowells for Thermometers and Electrical Temperature Sensors, General Specification for

MIL-T-24388C dated 30 March 1990 - Thermocouple and Resistance Assemblies, General Specification for (Naval Shipboard)

MIL-V-24578B dated 27 May 1988 - Valves, Globe, Pressure Instrument, Stem Test Connection, Union End

MIL-C-24643A dated 13 Mar 1996 - Cables and Cords, Electric, Low Smoke, for Shipboard Use, General Specification for

MIL-D-24709 dated 4 November 1988 - Distributed Isolation Material Type R-50-21/64, 4 November 1988

MIL-I-45208A dated 20 September 1995 - Inspection System Requirements, 20 September 1995

STANDARDS

MIL-STD-22D with Notices 1 and 2 dated 31 January 1984 - Weld Joint Design

MIL-STD-167/1 dated 19 June 1987 - Mechanical Vibrations of Shipboard Equipment (Type I, Environmental and Type II Internally Excited)

MIL-STD-167/2 dated 26 November 1991 - Mechanical Vibrations of Shipboard Equipment (Type III, Reciprocating Machinery)

MIL-STD-461E dated 20 August 1999 - Electromagnetic Emission and Acceptability Requirements

MIL-STD 470A with Notice 1 dated 26 August 1987 - Maintainability Program for Systems and Equipment

MIL-STD-781D dated 17 October 1986 - Reliability Testing for Engineering Development, Qualification, and Production

MIL-STD-785B dated 3 July 1986 - Reliability Program for Systems and Equipment Development and Production

MIL-STD-1310G dated 28 June 1996 - Shipboard Bonding, Grounding, and other Techniques for Electromagnetic Compatibility and Safety

STANDARDS (con't)

MIL-STD-1399, Section 300A with Notice 1 dated 11 March 1992 - Interface Standard for Shipboard Systems, Section 300A, Electric Power, Alternating Current

MIL-STD-1627C dated 30 September 1994 - Bending of Pipe or Tube for Ship Piping Systems

2.2.2 Other Government Documents, Drawings, and Publications

The following other Government documents, drawings, and publications form a part of this document to the extent specified herein.

PUBLICATIONS

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

S9074-AR-GIB-010/278 - Requirements for Fabrication Welding and Inspection and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

S9074-AQ-GIB-010/248 - Welding and Brazing Procedure and Performance Qualification

T9074-AS-GIB-010/271 - Requirements for Non-Destructive Testing Methods

S9073-A2-HBK-010 - U.S. Navy Resilient Mount Handbook

S9078-AA-HBK-010/DIM - Mount Design Handbook, Distributed Isolation Material (DIM) Navy - A Users Guide of Design, Procurement, Install and Inspection Info

S6430-AE-TED-010 - Technical Directive for Piping Devices, Flexible Hose Assemblies

0900-LP-001-7000 with Change 1 dated January 1981 - Fabrication and Inspection of Brazed Piping Systems

MIL-HDBK-267 - Guide for Selection of Lubricants and Hydraulic Fluids for use in Shipboard Equipment

803-1385850J - Piping, Instrument Pressure for all Service

803-1385884 - Unions, Fittings and Adapters, Butt and Socket Welding, 6000 PSI WOG NPS

NAVAL MEDICAL COMMAND

P-5010-6 (0520-LP-206-6300) - Chapter 6 - Water Supply Afloat

NAVMEDCOM Instruction 6240.1 - Standards for Potable Water

FEDERAL SPECIFICATION

QQ-N-00286F - Nickel Copper Aluminum Alloy, Wrought (UNS N05500), 29 November 1990

2.3 Non-Government Publications

The following documents form a part of this statement of work document to the extent specified herein.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

B15.1 - Mechanical Power Transmission Apparatus, Safety Standard for

B16.5 - Pipe Flanges and Flanged Fittings

NSF 60 - Drinking Water Treatment Chemicals - Health Effects

NSF 61 - Drinking Water Systems Components - Health Effects

ANSI/IEEE 315A dated 31 October 1975 - Graphic Symbols for Electrical and Electronics Diagrams

ANSI/ISO/ASQC Q9001-1994 - Quality Management Systems-Requirements

ANSI/ISO/ASQC Q9002-1994 - Quality Systems - Model for Quality Assurance in Production, Installation, and Servicing

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Boiler and Pressure Vessel Code, Section VIII Division I - Pressure Vessels

ASME Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications

ASME Boiler and Pressure Vessel Code, Section X - Fiber-Reinforced Plastic Pressure Vessels

B31.1 - Power Piping

Y14.1 - Decimal Inch Drawing Sheet size and Format

Y14.2M - Line Convention and Lettering

Y14.3M - Multiview and Sectional Drawings

Y14.5M - Dimensioning and Tolerancing

AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)

A 354-00a - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners

A 380-99 - Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment and Systems

A 563-00 - Standard Specification for Carbon and Alloy Steel Nuts

A967-99 - Standard Specification for Chemical Passivation Treatments for Stainless Steel Parts

B861-00 - Specification for Seamless and Welded Titanium and Titanium Alloy Pipe

D512-89 - Method of Test for Chloride Ion in Industrial Water and Industrial Waste Water

D1125-95 - Standard Test Methods for Electrical Conductivity and Resistivity of Water

D1141 - Substitute Ocean Water, Specification for

D4189-95 - Standard Test Method for Silt Density Index (SDI) of Water

D4516-95 - Standard Practice for Standardizing Reverse Osmosis Performance Data

F467-98 - Standard Specification for Non-Ferrous Nuts for General Use

F468-98 - Standard Specification for Non-Ferrous Bolts, Hex Cap Screws, and Studs for General Use

F593-98 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

F594-98 - Standard Specification for Stainless Steel Nuts

F992-86 - Specification for Valve Label Plates

F1166-95a - Human Engineering Design for Marine Systems, Equipment, and Facilities

F1508-96 - Specification for Angle Style, Pressure Relief Valves for Steam, Gas, and Liquid Use

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

250 - Enclosures for Electrical Equipment (1000 Volts Maximum)

ICS 1 - General Standards for Industrial Control and Systems

ICS 2 - Industrial Control Devices, Controllers and Assemblies

ICS 3.1 - Handling, Storage, and Installation Guide for AC General Purpose Medium Voltage Contactors and Class E controllers, 50 and 60 Hertz

ICS 4 - Terminal Blocks for Industrial Use

IEEE 45 dated 19 October 1998 - Recommended Practice for Electric Installations on Shipboard

MG 1 - Motors and Generators

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

1910.219 - Mechanical Power-Transmission Apparatus

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

J121 - Decarburization in Hardened and Tempered Unified Threaded Fasteners
J1453 - Specification for O-ring Face Seal Fitting
J1926/1 - Specification for Straight Thread O-ring Boss Ports

HYDRAULIC INSTITUTE

American National Standard for Reciprocating Power Pumps

MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY

MSS SP-119 - Bell End Socket Welding Fittings, Stainless Steel and Copper Nickel

2.4 Order of Precedence

In the event of a conflict between the text of this statement of work document and the references cited herein (excluding the specifications), the text of this statement of work document takes precedence. Nothing in this statement of work document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3.0 DETAIL REQUIREMENTS

3.1 Characteristics

The RO unit shall be capable of producing freshwater (potable grade) from seawater under all conditions of salinity, temperature, and Silt Density Index (SDI) as specified in para. 3.3.3. The unit shall require minimal operator attention and manning as specified in para. 3.4.1. The RO desalination unit shall be an electrically operated, package-type (skid mounted) unit ready for operation after installation aboard ship. The RO desalination unit shall be designed such that the envelope size for the complete 1,200 GPD unit shall be no greater than 62 inches tall, 34 inches wide, and 29" deep. The RO unit shall be designed such that all the access for unit operation and maintenance will be from the front of the unit (34 inch width) and require no more than a 62" tall, 34" wide by 28" deep maintenance envelope. There will no access to the sides, top, or rear of the RO unit when installed aboard ship. No permanent part of the RO shall extend into the maintenance access envelope area at the front of the unit. The dry weight of the unit shall not exceed 1600 lbs. The contractor installing the RO unit will be responsible for installing the piping and electrical cables interconnecting the RO unit with the machinery control console, power panels, and ship fluid systems using an installation procedure provided by the RO unit manufacture.

3.1.1 Ship Interface Connections

Piping interfaces shall terminate at the side edges of the RO unit boundary. Ship interface connections shall not terminate at the rear, top, or bottom edges of the unit. The size and location of the terminal connections shall match the attached piping size and terminate with a flanged mechanical joint. All low pressure piping system interface flanges shall be fabricated from bronze materials, in accordance with MIL-PRF-20042E, (copper nickel piping systems only) or the same material as the piping and dimensionally in accordance with ASME/ANSI B16.5 or with Mil. Spec. MIL-PRF-20042E dated 16 September 1999 for non-ferrous alloy flanges with a flat face flange facing and non-metallic gaskets. The connections for the seawater feed supply, brine discharge, freshwater flush supply, and permeate outlets shall be located on the unit lower right side of the perimeter. The common unit gravity drain connection for the complete system and the LP air supply (if used) shall be located either the right or left side edge of the envelope. The piping

interface connections shall not be located such that they will interfere with RO unit maintenance. The following piping interfaces shall be required:

- a. **Seawater supply to the unit.-** RO system shall be supplied with single 3/4" NPS seawater supply located on the lower right side perimeter of the unit. This seawater supply will be provided from a pressurized firemain system maintained at 95 to 150 psi. The RO unit shall be designed to operate with a seawater supply pressure within this range without the need for a pressure reducing station. Piping class shall be 200 with 150 psi flanges. The low pressure seawater supply inlet piping system design pressure shall be at least 150 psi.
- b. **Brine discharge overboard.-** One 1/2" NPS interface connection for the RO unit, located on the lower right side perimeter, shall be provided. Piping design pressure shall be 50 psi.
- c. **Permeate discharge to storage tank.-** One 1/2" NPS interface connection for the RO unit, located on the lower right side perimeter, shall be provided. Piping design pressure shall be 50 psi.
- d. **Permeate discharge to waste.-** One 1/2" NPS interface connection for the RO unit, located on the lower right side perimeter, shall be provided. Piping design pressure shall be 50 psi.
- e. **Gravity drain.-** One 3/4" NPS interface connection shall be provided for the RO unit. Pretreatment, high pressure pump, and system/component drain/vent and pump gland cavity drains, as necessary, shall be combined into a single connection for connection to the ships gravity waste water drain system. Piping design pressure shall be 50 psi.
- f. **De-chlorinated freshwater flush supply.-** One 1/2" NPS interface connection for the RO unit, located on the lower right side perimeter, shall be provided. Normal freshwater supply operating pressure shall be 40 psi, maximum operating pressure shall be 50 psi. Piping system design pressure shall be 50 psi.
- g. **Low Pressure (LP) air supply.-** One 1/4" NPS or female straight thread interface connection for the RO unit shall be provided for the RO unit if needed. Normal LP Air supply pressure will be 100 psi. Piping system design pressure shall be 150 psi.

3.1.2 System Requirements

The RO unit shall include the appropriate piping components (piping, fittings, valves, check valves, relief valves, etc.), pumps, and flowmeters to ensure that the following requirements, at a minimum, are satisfied:

- a. Isolating, draining, and re-filling the filter vessel(s) to permit cartridge filter replacement.
- b. Automatically back-flushing and rinsing the media filter.
- c. Protecting the brine, permeate, and high pressure seawater feed systems from over-pressurization.
- d. Isolating the seawater feed to the RO unit.
- e. Maintaining seawater feed pressure to the HP pump within the limits prescribed by the pump manufacturer.
- f. Automatically freshwater flushing the RO unit whenever the unit is secured or weekly when the unit has not been operated.
- g. Automatically flushing the RO unit media filter weekly when the unit has not been operated.
- h. Preventing the brine and permeate from back-flowing into the RO unit.
- i. Measuring the brine (or feed) and permeate flow rates of each pass in GPM and the cumulative total of final permeate produced in gallons.
- j. Venting of entrained air from incoming feedwater.
- k. Minimizing entrapped air in the RO unit.
- l. Permitting the continuous operation of the RO unit when salinity monitoring device is removed for repair or replacement.

m. Collecting unit drainage (pump shaft/plunger seal leakage, relief valve discharge, filter vessel drainage, piping, and component drainage as necessary) to a common point.

n. Discharging permeate overboard through a dedicated connection.

3.1.3 Shelf Life

Shelf life capability of the RO system shall be no less than 12 months. Shelf life is the period of time from delivery until system startup. Following the shelf life period the RO shall still have the specified operational service life without component or part replacement, adjustment, or maintenance action.

3.2 Qualification

RO units furnished under this statement of work document shall be products that are manufactured in accordance with the inspection requirements of either para. 3.2.1 or 3.2.2.

3.2.1 First Article

A sample unit shall be subjected to first -article inspection along with other tests and requirements as specified in para. 4.3.

3.2.2 Quality Conformance

The RO unit shall be subjected to quality conformance inspection in accordance with para. 4.4, which includes an 8-hour operational test.

3.2.3 Configuration Changes

Any modifications to a previously qualified design RO unit shall be the basis for repeating first article testing (see para. 3.2.1) of the entire unit or component. The Contractor may request from the procuring activity a waiver of all or part of the first article tests. The request shall provide a technical rationale for the waiver. The procuring activity shall make the final determination on the waiver request.

3.3 Performance Requirements

3.3.1 Capabilities

When operating at specified environmental conditions (see para. 3.3.6) and within the specified pressure limits (see para. 3.3.2), the RO desalination unit shall be capable of producing acceptable quality permeate (see para. 3.3.4) over the entire range of specified seawater conditions (see para. 3.3.3). Production rate under various seawater conditions shall be in accordance with para. 3.3.1.1. In addition, the RO unit shall remain on-line, producing acceptable quality permeate (see para. 3.3.4) with seawater temperature swings of 18 degrees F without operator interface.

3.3.1.1 Permeate Production Rate

The design capacity of the RO unit, with a first pass 0.85 membrane fouling factor or the equivalent applied, shall be 1,200 GPD with a seawater feed salinity of 45,000 ppm and feed temperatures between 75 degrees F and 104 degrees F. The maximum first pass permeate recovery shall not exceed 26 percent. For a 60 degrees F seawater feed temperature and feed salinity of 45,000 ppm, the production rate shall not be less than 800 GPD. At the feed salinity of 45,000 ppm and a feed temperature of 75 degrees F the unit shall be capable of meeting full rate without exceeding the allowable operating pressure. A means shall be provided for ensuring uniform permeate flow rate over time such that a variation in permeate flow does not deviate by more than ± 1 percent of the nominal set value during any 15 minute operating period. Brine/concentrate throttling devices shall be utilized to ensure uniformity of flow with operating time. Gate and ball valves shall not be used for throttling. The maximum permeate and brine back pressure on the RO unit is expected to be 15 psi.

3.3.2 Operating Pressure

The RO unit operation shall not exceed RO membrane element manufacturer's operating pressure limitations.

3.3.3 Natural Seawater Feed Characteristics

For design purposes, natural seawater feed entering the RO unit shall be considered to have the following characteristics.

SEAWATER PROPERTIES	CHARACTERISTIC
Total Dissolved Solids (TDS)	25,000 to 45,000 ppm
Maximum Silt Density Index (SDI) (15 minutes) (ASTM D 4189)	6.0
High density suspended solids (specific gravity >1.7, size >75 micron)	20 ppm (nominal)
Low density suspended solids (specific gravity <1.7, size <75 micron)	30 ppm (nominal)
pH range	7.0 - 8.4
Temperature range	35 - 104°F

3.3.4 Permeate Water Quality

The permeate (freshwater) quality shall meet the requirements of NAVMEDINST 6240.1 and NAVMED P-5010-6 and that permeate salinity be 25 ppm TDS or fewer. With new membranes installed and operating with 45,000 ppm seawater feed, permeate salinity shall not exceed 20 ppm TDS throughout the seawater inlet temperature range given in para. 3.3.3.

3.3.5 Service Life

Each unit shall be designed for a useful service life of 20 years without a failure of the following major components: RO pressure vessels (including end caps), media and cartridge filter housings, strainer housings, centrifugal separator, high-pressure pump casing(s), pulsation reduction device housings, piping and unit frames and base(s).

3.3.6 Environmental Conditions

Each unit shall be designed for operation at ambient air temperatures between 60 and 125 degrees F. Seawater splashing onto the unit can be expected to occur during filter element replacement.

3.4 Operation

3.4.1 Normal Operation

RO unit shall be designed to start-up and produce the specified quantity and quality of permeate within 15 minutes or less. Normal operation shall require no more than 5 minutes of single operator attention for every 4 hours of operation. The maximum time for normal shutdown, including freshwater flushing, is 20 minutes. See para. 3.5 for description of control and indication system.

3.4.2 Monitoring

A means shall be provided to monitor the first pass permeate. A means shall be provided to monitor and automatically divert high TDS final permeate (as specified in para. 3.3.4) to waste and to ensure that the unit shall continue to operate during this time. A means shall also be provided for manually (not automatically) redirecting permeate from waste line back to the freshwater tanks when permeate readings are acceptable. The monitoring system

and the components to automatically divert high TDS permeate shall meet paras. 3.5.2, and 3.19.14.

3.4.3 Startup/Shutdown

The unit shall be started manually until operating normally and producing acceptable quality permeate as specified in para. 3.3.4. The unit shall be automatically monitored for abnormal conditions by controls and indicators as specified in para. 3.5 and shall automatically shutdown when any one of the shutdown conditions identified in Table I is encountered. Once the operator has corrected the problem, the unit shall be restarted manually. Fully automatic restarts shall not be allowed, except when back-flushing the media filter.

3.4.4 Restrictions on Use of Chemicals

The use of chemicals is prohibited for normal operation in order to minimize Hazardous Material (HAZMAT) storage, handling aboard ship, and discharge. Chemicals may be provided for use in the event that cleaning of membrane elements is necessary (see para. 3.19.20) following mineral scale, organic or hydrocarbon contamination. Such cleaning, however, is not to be construed as a normal operational procedure. Installation of a permanently mounted cleaning tank is not required.

3.4.5 Energy Consumption

The RO unit shall produce the specified rate of permeate with an energy consumption of 80 BTU/lb (convert to BTU/gal) permeate or less. Energy consumption shall be calculated on the basis of the pumping energy consumed by electrical motors and the electrical power consumed by other electrical components used in the process of desalinating the feed seawater at a salinity of 45,000 ppm TDS and 75 degrees F temperature.

3.5 Controls and Indicators

Monitor, alarm, startup and shutdown functions for the RO unit shall be centralized on a Human Machine Interface (HMI) flat panel display. Aligning unit for operation, manual activation of media filter back-flush and rinse, seawater feed, freshwater flush, freshwater flush pump start/stop, permeate dump valve test and activation shall be provided from the HMI. The minimum instrumentation for a reverse osmosis unit shall be as listed in Table I and para. 3.5.1.4. Installation shall be as detailed in para. 3.20. The interface shall display the first out indication where only the first condition to cause a summary fault or alarm is indicated prior to acknowledging the alarm. The HMI shall also provide access to a history of unit alarm condition and frequency of media filter back flush and unit freshwater flush history. Dedicated circuits shall be provided for each of the remote indications as listed in Table I. Dedicated circuits, rated for 120VAC/28VDC using internal normally open or external normally closed contact circuits, shall be provided for remote indication of unit status (RO unit operating or secured), summary fault, summary alarm, salinity dump valve position, remote commanded unit emergency shutdown (without freshwater flushing), freshwater flush pump start/stop and salinity dump valve actuation (remote powered signal). Analog signals for high pressure pump discharge pressure (4-20mA) and permeate salinity (0-1mA isolated signal) shall be provided. Each of these circuits will be connected to a dedicated data acquisition/command interface to the ships machinery control system and displayed or controlled from the ships machinery control consoles. Electrical controls and instrumentation shall not be located in areas where they could be exposed to fluid leakage during calibration and maintenance. The brine and concentrate back pressure control throttling devices shall be within direct line of sight of the permeate flow meter indications.

3.5.1 Installation

Pressure instruments and associated piping shall be installed as detailed in drawing, NAVSEA No. 803-1385850, Rev.J, dated 31 July 1990. In addition, the following shall apply:

- a. Each instrument shall have an individual gage isolation and test valve. The isolation valve shall be in accordance with Mil. Spec. MIL-V-24578B dated 27 May 1988.
- b. Instrument tubing below 1/4-inch outside diameter is prohibited.
- c. Pressure connections for instrumentation shall be external threaded for "O-ring" face seal union in accordance with SAE J1453. Internal threaded connections to mechanical or electrical instrumentation shall be in accordance with SAE J1926/1. Tapered pipe threads are prohibited, except for freshwater systems with design pressures below 50 psig, provided the unit passes the shock and vibration testing requirements.
- d. Materials selected for the fluid containing components shall be in accordance with para. 3.16.
- e. Components shall meet the pressure rating and temperature of the fluid that is being monitored.
- f. Instrument root valves are not required.

3.5.1.1 Pressure Instruments

Pressure gages, where used, shall use U.S. Customary (English) units of measurement. The range of scale chosen shall be such that the normal operating point is in the middle half (25 to 75 percent) of the scale. Pressure gages shall have a manually adjusting red-colored pointer in addition to the indicating pointer. The red hand shall be set at approximately the more critical maximum or minimum operating pressure for the applicable system. Pressure transducers, with remote readouts on the HMI, shall be used for all indications needed for monitoring and control of the RO unit. Snubbers, in accordance with Mil. Spec. MIL-PRF-2940D dated 13 April 1999, shall be provided in the sensing line to all transducer and to pressure gages subject to pulsation. Pressure instruments shall meet the visibility requirements of ASTM F1166.

3.5.1.2 Temperature Instruments

Thermometers shall use U.S. Customary (English) units of measurement. The range of scale chosen shall be such that the normal operating point is in the middle half (25 to 75 percent) of the scale. The accuracy shall be within ± 1 percent of the full scale. Thermometers shall conform to Mil. Spec. MIL-I-17244E with Notice 1 dated 7 June 1991. Thermometer first article testing in accordance with MIL-I-17244 may be waived provided the RO unit shock and vibration and endurance test requirements are met. Thermocouple and resistance temperature detector assemblies in accordance with Mil. Spec. MIL-T-24388C dated 30 March 1990, with remote readouts may be used in lieu of thermometers, provided the provisions in this section are met. Piping temperature instruments shall be installed in sockets (wells). Thermowells shall be 3/8 inch nominal bore diameter in accordance with Mil. Spec. MIL-T-24270B dated 2 September 1983. The temperature instrument shall meet the visibility requirements of ASTM F1166.

3.5.1.3 Not used

3.5.1.4 Manually operated switches

Manually operated switches and indicators shall meet the requirements of Mil. Spec. MIL-C-2212H dated 10 February 1997 or as detailed in para. 3.20. Table II lists typical switches, applicable indicators, and their function. Switches shall preclude inadvertent actuation, restarting of the unit or actuation of any electrical component after power is restored following a loss of power situation, and shall be readily accessible.

TABLE I.- LIST OF MONITORS, ALARMS, AND SHUTDOWNS

DESCRIPTION	INDICATION/ METER	ALARM INDICATION	RO UNIT SHUTDOWN	REMOTE INDICATION
Pressure				
Feedwater supply	X			
Freshwater flush supply	X	LO	LO	Summary fault (when flushing)
Permeate discharge press	X			
HP pump suction	X		LO	Summary fault
HP pump discharge	X		HI	Summary fault Analog Signal
Media and Cartridge Filter				
Inlet	X			
Outlet	X			
Differential pressure				
Cartridge Filter	X	HI		Summary alarm
Media Filter	X	HI		Summary alarm
		(if not reset following backflush)		
Temperature				
Feed inlet	X			
Flow				
Feedwater or brine	X			
First Pass Permeate (gpm)	X			
Final Permeate (gpm)	X			
Final Permeate (totalizing)	X			
Salinity				
First pass conductivity	X			
Final permeate conductivity (trips dumping system)	X	HI		Summary alarm Analog Signal
High pressure pump overload			Overload	Summary fault
Elapsed operating time	X			
Permeate Sterilizer Failure		X		Summary alarm

TABLE II.- LIST OF MANUAL SWITCHES (TYPICAL)

SWITCH DESCRIPTION	LAMP	FUNCTION
Start/Stop	X	Energizes system to operate and start HP pump (provided all pump permissives are met)/Secures system and initiates fresh water flush
Normal/Manual Operation		Allows operation with control system bypassed.

3.5.2 Salinity Indicating System

The equipment shall have the ability to monitor first pass and final permeate conductivity and activate the final permeate dump valves and HMI indicators and alarms. A high salinity condition shall actuate an audible alarm in addition to the summary alarm and high salinity indication. The meter range shall be in either micromhos/cm or microSiemens/cm. The salinity monitor shall be fully temperature compensated. A completely isolated 0-1 mA DC analog output shall be provided for remote indication of the salinity reading. The salinity cell installation shall allow for removal of the salinity cell and manual sample collection while the RO system is operating for maintenance and repair. Salinity cell removal shall be accomplished without having to twist the attached cable.

3.5.2.1 Mounting

Salinity system monitor shall be either incorporated into the control system cabinets or mounted adjacent to the control system enclosure.

3.5.2.1.1 Identification

Identification plates for the salinity cells shall be attached to the cell body. The following minimum information shall be provided:

SALINITY MONITOR	SENSOR
Manufacturer's name and serial number	Manufacturer's name and serial number
Ratings and range	Cell constant
Part number	Part number

3.5.2.3 Operating Instructions

Instructions for operating and interpreting all controls and indicators of the salinity indicating equipment shall be indicated on the HMI. At a minimum, the following instructions shall be provided:

- Testing the conductivity monitor and dump valve operation.
- Acknowledging an alarm condition.
- Resetting and alarm condition and re-activating the dump valve.

3.5.2.4 Salinity Monitor Cooling

Monitor cooling shall be accomplished using only external natural air convection circulation. Fluids other than natural convection air are prohibited.

3.5.2.5 Access to Internal Parts

Ready access to all internal parts shall be obtained through the hinged front door of the control panel.

3.5.2.6 Alarm Level Control

A means shall be furnished for checking monitor operation on the HMI so that the operator can observe the visual and audible alarm signal and dump valve actuation.

3.5.2.7 Alarms

The characteristics of both the audible alarms and visual displays shall be in accordance with ASTM F1166.

3.5.2.8 Dump Valve

The salinity indicating system shall be provided with the means to automatically actuate an independent, solenoid operated dump valve to divert high TDS water overboard via a sight flow indicator. An indicator shall

illuminate on the HMI whenever the dump valve is diverted to discharge overboard.

3.5.2.9 Accuracy

The accuracy of the salinity indicating equipment shall be as follows:

- a. Salinity monitor accuracy (simulated input at the monitor) plus or minus 3 percent of full scale meter arc.
- b. System accuracy (actual input from sensors). The salinity monitor meter shall duplicate the standard reference instrument within plus or minus 5 percent of monitor meter full scale arc in accordance with para. 4.5.16.3.
- c. Sensor cell constant accuracy - plus or minus 2 percent when tested in accordance with method A of ASTM D1125.
- d. Alarm accuracy plus or minus 5 percent of set point.

3.5.2.10 Sensor Temperature Compensator Response

The time required to reach 63 percent of a 50 degrees F change in fluid temperature (that is, 63 percent of the difference in resistance between stabilized baths) shall be less than 30 seconds (see para. 4.5.16.2).

3.5.2.11 Overrange

The salinity indicating equipment shall be capable of being overranged, including having a short circuit across sensor electrodes, temperature compensator, and both electrodes and temperature compensator without damage to sensor or salinity monitor (see para. 4.5.16.4).

3.5.2.12 Calibration

The salinity monitor calibration procedures and test equipment using test resistors shall be provided.

3.6 Preventative Maintenance and Repair

Maintenance actions and repairs, with the exception of motor rewinding, shall be capable of being performed on board ship using the available access detailed in Para 3.1. The following accessibility requirements shall apply:

- a. All major test points, adjustments and servicing points peculiar to the unit shall be readily accessible without the need to first remove obstructions. Any component that is subject to periodic inspection or replacement shall, likewise, be readily accessible without the need to remove obstructions.
- b. Warning labels shall be readily visible and readable by the operator while standing or kneeling adjacent to the unit. These plates shall be mounted on or adjacent to the unit.
- c. Unit components that weigh more than 44 pounds and are removable for maintenance or in-place repair shall have lift lugs, eyes, or pads.

3.6.1 Preventative Maintenance

Preventative (scheduled) maintenance, except for a daily visual inspection, shall be required no more than once every 7 days.

3.6.2 Repair

Requirements for non-standard size and special tools, jigs, and fixtures shall be kept to a minimum. Those special tools, jigs, and fixtures that are required for maintenance or repair shall be supplied with the RO unit. Special tools are defined as those items not listed in the Federal Supply Catalog. The unit shall be designed to allow for disassembly and re-assembly without the need for welding when replacement of components is required.

3.7 Reliability

The Contractor shall provide a standard warranty for the RO system for a minimum period of one year from activation aboard ship. The RO unit shall meet or exceed the following requirements:

Mean-Time-Between-Failure (MTBF)(operating hours)	2000
Operational availability-A _o (percent)	99
Unit design life (years)	20
Mean-Time-To-Repair (MTTR) (hours)	3.0
Maximum-Time-To-Repair (Mmaxct) (hours)	6.0
Mean-Preventative-Maintenance-Time (Mpt) (hours)	0.5
Maximum-Preventative-Maintenance-Time (Mmaxpt) (hours)	1.0
Minimum time between overhauls (pump only) (operating hours)	10,000
Mean maintenance time (hours per month continuous operation)	2.0

3.8 Hydraulic Pressure

All components of the unit which are exposed to positive pressure, with the exception of the membrane elements, shall withstand, without plastic yielding, permanent deformation, or malfunction (leakage and so forth), a hydrostatic test pressure of 1.5 times the design pressure of the item for no less than 30 minutes.

3.9 Interchangeability

In no case shall parts (except for the first and second pass membranes) be physically interchangeable or reversible unless such parts are also interchangeable or reversible with regard to function, performance, and strength.

3.10 Electromagnetic Interference

The RO unit shall meet the electromagnetic interference (EMI) requirements of MIL-STD-461E dated 20 August 1999 for surface ship equipment mounted below deck.

3.11 Not used.

3.12 Vibration Requirements

The complete RO system shall meet the requirement of MIL-STD 167-1 for the frequency range of 4 to 50Hz. Reciprocating type high pressure pumps (if used) shall also be analyzed and tested for Type III torsional vibration in accordance with MIL-STD-167/2.

3.13 Requirements Due to Ship Attitude or Motion

The complete RO system assembly shall be mounted with the long axis in the forward/aft alignment. The unit shall maintain design performance without damage or degradation when under the following conditions:

- When the ship is permanently trimmed down by the bow or stern as much as 7 degrees from the normal horizontal plane.
- When the ship is permanently listed up to 15 degrees to either side of the vertical.
- When the ship is pitching 15 degrees up or down from its normal horizontal plane with a period of 9 seconds.
- When the ship is rolling up to 35 degrees to either side of the vertical with a period of 9 seconds.

3.14 Vibration Control

Resilient mounts shall be provided for the high pressure pump base, attached components. Resilient mounts shall be selected and installed in accordance with publication, S9073-A2-HBK-010. Distributed Isolation Material (DIM), resilient or Government-approved mounts maybe used to further

isolate the high pressure pump from the ship's structure (see paras. 3.19.24 and 3.19.25). These DIM mounts (if used) shall be provided with the RO unit.

3.15 Identification Plates

The RO unit shall bear an identification plate with the following information:

- a. Item identification (equipment title, serial number, part number)
- b. Size (1,200 GPD)
- c. Name and address of manufacturer
- d. Contract or order number (use width of plate to allow maximum number of spaces)
- e. National stock number (allow 20 spaces)
- f. Date of manufacture.

Label plates shall be clearly legible, permanently secured, and shall last for the life of the RO unit.

3.15.1 Valve Identification Plates

Valves shall be marked in accordance with ASTM F992, with the valve function or description and the valve number identified in the flow schematic.

3.15.2 Information Plates

Information plates shall be provided for the complete system and shall include, but not be limited to: startup and shutdown procedures and flow schematics. A single set of these plates shall be provided with the RO system for mounting by the installation contractor. Information plates shall meet the visibility requirements of ASTM F1166.

3.16 Materials

Materials used in the RO unit shall be compatible with the environment in which they will operate and provide the desired service life. The maximum general corrosion rate or pitting corrosion rate shall be limited to 2 mils per year (mpy) for those internal surfaces and materials used to contain, carry or transport seawater. Acceptable metallic materials and fittings for contact with seawater are nickel-aluminum-bronze, valve bronze, 90-10 or 70-30 copper-nickel, monel, titanium, Superaustenitic alloys such as AL-6XN (UNS N08367), SMO-254 (UNS S31254), or cast 20Mo6 (UNSJ94631), Superduplex alloy type 2507 (UNS S39275), or Ni-Cr-Mo-Fe alloy such as Hasteloy C276 (UNS N10276), C-22 (UNS N06022), C-2000 (UNS N06200), 59 (UNS N06059), or 686 (UNS N06686). Acceptable metallic materials and fittings for contact with seawater during normal operation and flushed with freshwater while unit is secured also include alloy 20, CD4MCu and CN7M. All stand-alone non-metallic materials that may come in contact with permeate shall be ANSI NSF 60 and NSF 61 approved. This includes thread lubricants, O-ring lubricants, and hoses. This requirement does not apply to non-metallic parts contained inside a metallic component such as valve packing or soft seat materials.

3.16.1 Excluded Materials

3.16.1.1 Stainless Steel

Austenitic stainless steels (UNS 300 and 400 series) and high ferrous alloy steels shall not be used in any components or piping used for containing, carrying, or transporting seawater, first pass permeate, second pass concentrate, or brine. Use of austenitic stainless steel allows is permitted for components or piping carrying or transporting second pass permeate.

3.16.1.2 Copper-silicon Fasteners

Copper-silicon and silicon-bronze fasteners shall not be used.

3.16.1.3 Mercury

RO units shall contain no mercury in any form. No mercury-bearing instruments or equipment, except for mercury-vapor lighting, that might cause contamination shall be used in the manufacture, fabrication, assembly, or testing of any material. In the event of any accident involving mercury contamination of the material being furnished or suspicion of such contamination, notify procuring activity immediately.

3.16.1.4 Magnesium and Aluminum

Magnesium and magnesium alloys shall not be used in any component. Aluminum and aluminum alloys shall not be used for water-wetted applications.

3.16.1.5 Cadmium Plating

Cadmium plating shall not be used on any component.

3.16.1.6 Plastics

Toxic materials such as polyvinyl chloride (PVC), chlorinated polyvinyl chloride (CPVC), polybutadienes (PB), polyethylene (PE), and acrylonitrile-butadiene-styrene (ABS) shall not be permitted to be used in any component of the RO unit because of fire hazard. Membrane elements contained within a pressure vessel are excluded from this requirement.

3.16.1.7 Silicone

To eliminate the potential for fouling the RO membrane, the use of silicone lubricants and sealants shall be minimized anywhere they can come in contact with the direct feed to the membranes. Where silicone is in contact with the direct feed to the membranes, guidance shall be provided to ensure sparing application of the silicone.

3.16.1.8 Lead

Lead and its compounds shall not be used where they can come in contact with seawater feed, permeate, or freshwater. The lead content in bronze alloys shall not exceed levels allowed by ASTM B61. Lead bronze alloys shall not be used.

3.16.1.9 Recycled, Recovered, or Environmentally Preferable Materials

Recycled, recovered, or environmentally preferable materials shall be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.16.2 Corrosion Prevention/Control

For seawater wetted components, mating materials shall be galvanically compatible as mating materials having electromotive force (emf) difference less than 200 millivolts (mV). Where the materials are not compatible within 200 millivolts (mV), they shall be properly isolated. Paint shall not be considered an appropriate insulator for this application.

3.16.3 Moisture and Fungus Resistance

The unit shall be designed so that its constituent materials are not nutrients for fungi. The materials used, other than the RO membranes and filter media, shall not absorb and hold moisture. No materials used in the RO unit shall degrade in the presence of moisture.

3.16.4 Lubricants

Lubricants and/or hydraulic fluids shall be selected from those standard lubricants and hydraulic fluids listed in MIL-HDBK-267. Components and equipment that do not require relubrication by ship's force during routine maintenance between overhauls are not required to utilize a standard

lubricant. The use of lubricants not listed in MIL-HDBK 267 will require written approval from NSWC.

3.17 Fabrication

3.17.1 Welding and Brazing

Welding and inspection of pressure vessels, castings and piping shall meet the requirements of publication, NAVSEA S9074-AR-GIB-010/278. Joint design shall meet the requirements of MIL-STD-22D dated 31 January 1984. There shall be no pockets, crevices, porosity, or notches, which could become points of stress concentrations. The use of backing strips in pressure vessels shall not be permitted. Silver-brazed piping joints shall be accomplished in accordance with publication, NAVSEA 0900-LP-001-7000. Silver brazed piping joints are not permitted in class P-1 piping or A-1 pressure vessels per NAVSEA S9074-AR-GIB-010/278. Any brazing alloy containing less than 43 percent silver shall not be permitted. All structural welding and inspection shall meet the requirements of publication, NAVSEA S9074-AR-GIB-010/278. Requirements for nondestructive testing shall conform to publication, NAVSEA T9074-AS-GIB-010/271. Welding procedure and welder performance qualifications shall be accomplished in accordance with publication, NAVSEA S9074-AQ-010/248.

3.17.2 Casting Inspection and Repair

Inspection and repair of castings shall meet the requirements of sections 12 and 13 of publication, NAVSEA S9074-AR-GIB-010/278. Requirements for nondestructive testing shall conform to publication, NAVSEA T9074-AS-GIB-010/271.

3.17.3 Pressure Vessels

All pressure vessels, except for cast metallic strainer bodies (if used) shall meet the regulations of ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 or Section X, Class I, but do not require ASME stamping regardless of size or pressure. Glass Reinforced Plastic (GRP) pressure vessel attachments and supports , if used, shall meet the performance requirements of ASME, Section X, Appendix AA-5 .

3.17.4 Frames and Bedplates

The frames and bedplates used to mount the RO unit components shall not contain pockets where moisture can accumulate. A means for lifting removable frames and bedplates shall be provided.

3.17.5 Threaded Parts

Threaded fasteners shall be in accordance with Mil. Spec. MIL-S-1222G dated 29 December 1980. Seawater piping flange fasteners shall be a nickel copper alloy. Other piping flange fasteners and any piping support fasteners or U-bolts shall be corrosion resisting steel. Other component fasteners may be either a nickel copper, corrosion resisting steel, or grade 5 or 8 alloy steel where bolting strength is paramount. Nickel copper (Monel) 400 alloy ASTM fastener systems in accordance with ASTM F467 and 468 maybe used as an alternate to Mil. Spec. MIL-S-1222G dated 29 December 1980. Nickel copper aluminum (K-Monel) 500 alloy ASTM fastener systems in accordance with ASTM F467 and ASTM F468 maybe used as an alternate to Mil. Spec. MIL-S-1222G dated 29 December 1980 provided the materials are in accordance with Fed. Spec. QQ-N-00286F dated 29 November 1990. Stainless steel ASTM fastener systems in accordance with ASTM F593 and 594 may also be used as an alternate to Mil. Spec. MIL-S-1222G dated 29 December 1980 provided fasteners are passivated in accordance with ASTM A380. Grade 5 or 8 alloy steel ASTM fastener systems in accordance with ASTM A354 and 563 may also be used as an alternate to Mil. Spec. MIL-S-1222G dated 29 December 1980 provided fasteners are subject to decarburization testing that is performed on one sample per lot in accordance with SAE J121, Class B where each lot is defined as a heat treatment furnace

load. In addition, ASTM A563 inspection lot sizes and sampling shall be modified to require 2 samples per lot for 50 pieces or less lot sizes, and 3 samples for lots with 50 or more pieces. The complete lot shall be rejected if 1 nut fails to meet the test criteria. Straight thread O-ring fittings shall meet the requirements of SAE J1926/1. The use of non-standard threaded fasteners is prohibited.

3.17.6 Painting

RO unit components shall be painted before assembly in accordance with the following:

- a. Resilient mounts and hoses shall not be painted.
- b. The total paint system shall last a minimum of 10 years without blistering, cracking, peeling, or flaking.

3.18 Safety

The unit shall be designed so as to be free of personnel hazards. All safety features shall be such that their functions cannot be inadvertently degraded or negated during operation, storage, shipping, handling, or maintenance. All parts, components, and assemblies of the RO shall be free from sharp edges, burrs, protruding surfaces and other harmful extraneous material. Means shall be provided to ensure against damage to wires and cables from contact with rough or irregular surfaces and sharp edges.

3.18.1 Human Engineering

The unit design shall incorporate the human engineering requirements of ASTM F1166.

3.19 Components

The following equipment and component requirements shall apply.

3.19.1 Piping

Piping, valves, fittings, and associated piping components shall meet the requirements of ASME B31.1, except as modified herein. In addition to brazing flanges, allowed in ASME B31.1, welded copper nickel flanges of either the slip-on or weld-neck design are acceptable provided that interface geometry is unaffected. All low pressure piping system flanges shall be dimensionally in accordance with ASME/ANSI B16.5 or with Mil. Spec. MIL-PRF-20042E dated 16 September 1999, for non-ferrous alloy flanges, with a flat face flange facing and non-metallic gaskets. High pressure piping flanges shall also be dimensionally in accordance with ASME/ANSI B16.5 with either a raised face flange face and suitable spiral wound gasket or a grooved flat face design and fluorocarbon or EPDM O-ring seal. Union fittings, when used for high pressure piping take down joints, shall be in accordance with drawing, NAVSEA No. 803-1385884. Piping weld joints shall be in accordance with MIL-STD-22D dated 31 January 1984. Low pressure union fittings shall be in accordance with to Mil. Spec. MIL-F-1183J dated 5 May 1987 for copper nickel piping systems or conform dimensionally but be configured for socket welding and fabricated from the same material used in the piping system. Other methods and types shown in ASME B31.1, Paragraph 104.3 illustrates the desired principles of branch connections. Pipe socket welded joints shall be limited to 2-inch NPS and smaller. The use of miter joints or welded pipe branch connections shall not be permitted for any pressurized piping systems. Use of bell end socket weld fittings in accordance with MSS SP119 all size low pressure piping sections fabricated from 70-30 copper nickel materials is also approved. Victaulic fittings maybe used if limited to joints that will not require disassembly for component repair or replacement over the life of the unit provided the RO unit shock and vibration requirements are met. Tapered pipe threads or 37 degree flare are not acceptable except for freshwater systems with design pressures below 50 psi and provided the RO unit shock and vibration requirements are met.

The desired configuration shall have all required ship piping interfaces compatible with 70-30 Copper Nickel piping and fittings. Maximum velocity for titanium, Superaustenitic or duplex, monel (Nickel-Copper), or Ni-Cr-Mo-Fe alloy pipe and component nozzles shall be 15 ft/sec with a minimum velocity of 4 ft/sec. To ensure minimal pipe wall loss due to erosion, all copper nickel piping shall be 70-30. Sizing of 70-30 copper-nickel seawater and brine piping (and composite material components if used) shall be such that during normal operation, seawater velocity will be maintained as follows:

MAXIMUM VELOCITY FOR 70-30 COPPER-NICKEL PIPE AND TUBING

DIAMETER SIZE (inch)	MAXIMUM VELOCITY (ft/sec)
1/2 OD	5.0
5/8 OD	6.0
3/4 OD	6.0
1/2 NPS	6.2
3/4 NPS	6.8
1 NPS	7.4
1-1/4 NPS	8.2
1-1/2 NPS	8.6

3.19.1.1 Pipe and Tube Bends

The bending and fabrication of bent pipe and tube assemblies shall be in accordance with MIL-STD-1627 except that post bend weld treatment shall be in accordance with ASME B31.1 instead of Section 6 of MIL-STD-1627. Pipe or tube bend radius shall be no less than 2 times the pipe outer diameter (OD). For pipe or tubing bent to a radius of less than 5 times the OD, the piping or tubing shall have an increase in wall thickness over the wall thickness required for straight piping or tubing of the same size, material, and pressure rating, such that the resulting hoop stresses in the front wall does not exceed the maximum allowable stresses specified in ASME B31.1. All bent pipes shall be free of wrinkles. Buckles, bulges, humps, steps or dents shall not exceed 3 percent of nominal pipe OD and shall blend smoothly in a gradual manner.

3.19.1.2 Connections to Resiliently Mounted Components

Hard piping connections are not permitted between stationary and resiliently mounted components.

3.19.2 Hoses

High-pressure hose shall meet the requirements of S6430-AE-TED-010 for hose installation. Hose installations shall have minimal static loading (for example no "U" or 90-degree bends are permitted). The use of pre-formed or cast hose shall be avoided. All high and low pressure hose end fittings shall be a reusable design that shall not use band clamps to secure the hose to fitting. All hose fitting end designs shall conform to either an approved piping union or flange, SAE J1453 for an O-ring face seal or a split clamp arrangement using a face seal O-ring joint. A threaded female type connection into a component shall utilize a SAE J1926 straight thread O-ring seal. Tapered pipe threads or 37 degree flare are not acceptable except for freshwater system hose connections with design pressures below 50 psi and provided the RO unit shock and vibration requirements are met. The service life for the hose shall be 15 years. Appropriate materials (see para. 3.16) shall be selected for the hose and fittings. Flexible hose assemblies shall have a safety factor of 4 to 1 based on the burst pressure relation to the rated working pressure. In other words, the burst pressure is 4 times the rated working pressure. Each hose shall be marked at repetitive intervals along the lay-line with the information listed as follows:

- a. Manufacturer's name or trademark

b. Size by dash number (The dash number is normally the hose inside diameter in 16ths of an inch.)

c. Quarter and year of cure or manufacture.

The hose manufacturer may include additional information provided the repetitive interval is maintained.

3.19.3 Pretreatment System

The RO unit seawater pretreatment system shall be sufficient to ensure that for incoming seawater having the properties listed in para. 3.3.3 shall continuously provide filtrate to the membranes having an SDI of 5.0 or less and turbidity of 1 nephelometer turbidity unit (NTU). Pretreatment system shall be designed such that the final cartridge filters will not require replacement at less than after 1080 hours of continuous or intermittent operation when the unit is properly flushed with freshwater. Individual component design requirements and recommendations are listed in paras. 3.19.5 and 3.19.6.

3.19.4 Strainer

A single Y or simplex strainer with 1/32" mesh shall be provided with the RO unit. This strainer will be installed in the seawater feed system upstream of the RO unit. This strainer is installed by the installing activity and does not have to be included within the RO unit boundary.

3.19.5 Media Filter

A media type pre-filter shall be installed that automatically back flushes and rinses at a differential pressure set point and on a set periodicity. The filter shall be sized such that the media has a design life of at least 7,500 hours when operated on a seawater feed with the properties listed in para. 3.3.3. The control system shall be designed to automatically secure the RO unit when back-flushing is required and restart the unit automatically including automatically resetting the final permeate three-way dump valve to direct the final permeate to the ships potable water tanks when the back-flush and media filter rinse is complete. The media filter flux rate shall be no greater than 9 gpm per square foot of surface area. Back flush flow rate shall be approximately twice the normal feed flow rate. The rinse flow shall be approximately the normal feed flow rate. The media filter differential pressure shall be monitored and alarm condition displayed on the HMI when the filter differential does not drop below the reset point following a back flush. The media shall consist of the following granular semi-permeable standard material. The respective depth shall be specified by the RO unit manufacture.

Anthracite (top layer)

Effective size: 1.3-2.0 mm, Uniformity coefficient: 1.5-1.8

Anthracite (second layer)

Effective size: 1.0-1.6 mm, Uniformity coefficient: 1.5-1.8

Sand

Effective size: 0.4-0.8 mm, Uniformity coefficient: 1.3-1.8

Garnet

Effective size: 0.2-0.6 mm, Uniformity coefficient: 1.5-1.8

Gravel (distribution channel cover)

Effective size: 3-10 mm

3.19.6 Filters

A final cartridge type filter shall be installed upstream of the HP pump to provide final filtration and protect the pump and membranes from media carryover. Cartridge Filter elements available only from a single manufacturer are prohibited. Cartridge filter shall be sized with sufficient area to support a minimum cartridge life of 1080 hours when installed downstream of the upstream media filter. Filter elements shall be a standard 2 or 2.5 inches

diameter, 10 to 30 inch design. The filter differential pressure shall be monitored and alarm condition displayed on the HMI.

3.19.7 Pump Balancing

All moving components in reciprocating type pumps shall be balanced as necessary to meet the torsional vibration requirements of MIL-STD-167/2 dated 19 June 1987, type III. Clamped or glued weights are unacceptable.

3.19.8 Pump Motor Mounting

A means shall be provided for adjusting and aligning the pump to its driver. The pump and driver combination shall be mounted on a common platform. Direct coupled pumps shall be coupled to the motor using a dry type coupling that does not require lubrication. Belt driven pumps shall utilize a synchronous drive belt and sheave system.

3.19.9 Guards

Guards shall meet OSHA 1910.219 and ANSI B15.1 requirements for construction and safety.

3.19.10 Accumulators/Pulsation Dampeners

Accumulators and/or pulsation dampeners shall be used on all positive displacement pump designs and meet the requirements of Reciprocating Pump Standards of the Hydraulic Institute.

3.19.11 Permeate Sampling

A means shall be provided for obtaining samples of the permeate from each pressure vessel and from the combined final permeate discharge without disrupting the permeate output flow or dismantling piping or fittings.

3.19.12 Reverse Osmosis Element (Membrane) Isolation

A means shall be provided for isolating 100 percent of the installed first pass membranes by securing the permeate outlet without disrupting the feedwater and brine flow through the membrane.

3.19.13 Reverse Osmosis Element (Membrane)

The RO membrane element shall have a minimum stabilized salt rejection rate of 99.4 percent. The overall first pass membrane flux density with normal seawater feed (45,000 ppm of TDS) shall not exceed 12.5 gallons per square foot per day (gfd) at seawater temperatures up to 104 degrees F. The RO unit shall be designed to use membranes from three different manufactures. Second pass membranes shall be designed with a 0.95 membrane fouling factor or the equivalent. Second overall pass membrane flux shall not exceed 22 gallons per square foot per day (gfd).

3.19.14 Dumping System

A means shall be provided to automatically dump high TDS permeate to waste and to manually redirect permeate to freshwater storage tanks again, once satisfactory permeate quality has been restored. This component shall be equipped for indication at the ship's remote control panel when the system is in the dump mode. Within 1 second of receiving a signal from the salinity monitoring system, the dumping component shall be capable of redirecting permeate from the freshwater tank line to the overboard line. The component shall be provided with a means of manually diverting permeate flow to the ships storage tank during emergency conditions. The system shall automatically dump the permeate to overboard upon a loss of power. The dumping system shall meet the test requirements in para. 4.5.17.

3.19.15 Low Pressure Relief Valves

Low-pressure relief valves shall meet the requirements of ASTM F1508 with Supplements S1 through S4. Rupture disks shall not be used as a means of preventing over-pressurization.

3.19.16 High Pressure Relief Valves

High-pressure relief valves shall meet the requirements of ASTM F1508 with Supplements S1 through S4. Rupture disks shall not be used as a means of preventing over-pressurization.

3.19.17 Flow Measurement

The instrument shall have an accuracy of ± 5 percent or better at full flow. Paddle-wheel flowmeters shall not be used.

3.19.18 Totalizing Flowmeter

The totalizing permeate flow measurement shall have a repeatability of ± 2 percent over the full range of flows at a constant temperature. The totalizing flow measurement shall measure the permeate flowing into the freshwater tanks.

3.19.19 Freshwater Flushing

The RO unit shall include provisions and a connection to freshwater flush the complete system using de-chlorinated shipboard freshwater. This freshwater flush shall be initiated by activating a remote distilled water transfer pump (pump is not supplied with the RO unit) via a contact rated for 110 VAC, 1 phase, 60 Hz, and aligning the unit for the freshwater flush. This freshwater flush shall be accomplished automatically whenever the RO unit is secured and at one week intervals. The fresh water flush procedure and lay-up shall be suitable for extended lay-up of the RO unit without the use of chemicals. RO unit lay-up with chemicals shall only be required when there is no source of freshwater. The RO unit control system shall indicate a summary fault alarm and open the remote pump run contact when the freshwater flush fails to complete due to lack of sufficient fresh water pressure. The freshwater flush duration shall be identified by the RO manufacture and sufficient to reduce the total dissolved solids level of the concentrate discharge from the first pass to below 800 ppm TDS.

3.19.20 Chemical Cleaning Equipment

Provisions shall be installed to permit chemical cleaning/disinfection's of the first and second pass membranes independently. The desired cleaning method is to provide connections in the feedwater inlet, brine/concentrate, and permeate discharge for connection of a chemical cleaning circulation system. This chemical circulation system will circulate the cleaning/disinfectant chemicals through the membrane using a pump. This circulation system and pump does not have to be provided with the RO system as a special tool. The cleaning procedures and recommended materials must be detailed in the technical manual. Installation of a permanently mounted cleaning tank is not required.

3.19.21 High Pressure Pumps

The high pressure pump shall be a positive displacement design. The positive displacement pump shall be designed and tested in accordance with the American National Standard for Reciprocating Power Pumps.

3.19.22 Distributed Isolation Material (DIM)

If needed, the complete unit shall be sound isolated by "PAD TYPE" mountings of Distributed Isolation Material (DIM) or by resilient mounts (see para. 3.19.23). The DIM shall be selected on its demonstrated compatibility with the unit environment and shall be of the type manufactured by Fabreeka Products Co., Gilmore Industries Inc., Kohary Industries Inc., or equal in accordance with Mil. Spec. MIL-D-24709 dated 4 November 1988. In addition, the DIM shall be selected based on its ability to attenuate noise and

vibration in the desired frequency range and to avoid objectionable amplification outside that range. DIM shall be loaded to the degree required for proper isolation and shall be provided with means to prevent excess loading resulting from overtightening of mounting bolts as well as means to maintain the mounted item captive under shock. Mounting bolts shall have isolation bushings of material similar to the DIM to prevent metal-to-metal contact. Holes for mounting bolts shall be of sufficient diameter to provide clearance for the isolation bushings which is equal to twice the thickness of the isolation bushings. Guidance for selection, and installation of DIM mounts is provided in publication, NAVSEA S9078-AA-HBK-010/DIM.

3.19.23 Resilient Mounts

Resilient mounts for high pressure pump mounting or piping supports shall be selected and installed in accordance with publication, S9073-A2-HBK-010. Resilient elements shall not be painted except for temporary application of Spraylat, or equal. (For guidance regarding inadvertent painting of rubber elements and paint removal, see Section 2.5.2 of publication, NAVSEA S9073-A2-HBK-010). The resilient mounts shall only support the high pressure pump assembly and attached components (i.e. motor, belt guard, desurger, suction and discharge dogleg hose assemblies). The other RO system components shall be separately mounted, as required to meet the system shock, vibration, and noise requirements.

3.19.24 Permeate Treatment

The RO unit shall be provided with an ultraviolet sterilizer in the final permeate discharge to the ships potable water tanks. The sterilizer shall conform to ANSI/NSF 55-2002. Provisions shall be provided to secure power to the sterilizer under no flow conditions and indicate an alarm condition upon sterilizer failure.

3.20 Electrical Equipment

3.20.1 General

The RO unit shall operate with a separate 440 Vac, 60 Hz, three-phase, ungrounded delta power source for the high pressure pump. Electrical power for the control system or any other reduced voltage requirements shall be taken from the high pressure pump 440 Vac power source. All electrical cables outside electrical component enclosures shall be low-smoke cable per MIL-C-24643.

3.20.2 Motors

Electric motors shall meet the requirements of IEEE-45 and NEMA MG 1, and shall have the following characteristics:

- a. NEMA Design B
- b. Class F Insulation
- c. 50 degrees C, ambient
- d. Continuous duty
- e. TEFC, severe duty
- f. Airborne noise ≤ 80 dbA
- g. Bearing temperature rise $\leq 40^{\circ}\text{C}$ measured on the bearing outer ring
- h. Provided with double sealed bearings

The horsepower (hp) rating of each motor shall be in accordance with the motor ratings, but not less than 1.05 times the brake horsepower of the driven pump under rated conditions of capacity and pressure.

3.20.3 Control System Components

The motor controls, control logic devices, Programmable Logic Controllers (PLC), switches, and HMI system shall meet the requirements of Mil. Spec. MIL-DTL-2212H dated 10 February 1997. The HMI and control system shall provide both visual and audible alarms. The HMI shall only indicate the first alarm or fault until the alarm is acknowledged. Manually operated switches, controllers, master switches, and relays shall also meet the requirements of Mil. Spec. MIL-DTL-2212H dated 10 February 1997. A terminal board shall be provided for connection of the remote indications and control inputs identified in para. 3.5. Commercial-Off-The-Shelf (COTS) components maybe used provided provisions are taken to meet the qualification requirement contained in this statement of work document. These components shall meet the requirements of IEEE 45 and NEMA ICS 1, ICS 2, ICS 3.1 and ICS 4 as applicable. The controller for a positive displacement type high pressure pump shall incorporate a reduced voltage or soft start control system. This system shall meet the interface requirements specified in MIL-STD-1399, Section 300A, Notice 1 dated 11 March 1992. The soft starter shall not require a cool down period prior to initiating or reinitiating a normal stop or restart. The soft start shall be capable of restarting the motor at any time, including immediately following shutdown. There shall be no limit on the number of consecutive starts. This system shall also meet the interface requirements specified in MIL-STD-1399, Section 300A with Notice 1 dated 11 March 1992 including power quality requirements. Use of a line to line EMI filter is considered acceptable to meet the EMI requirements specified in section 3.10. EMI filter line to ground capacitance shall be in accordance with MIL-STD 1399, Section 300A with Notice 1 dated 11 March 1992.

3.20.3.1 Control Panel

The control panel and its components shall meet the requirements of Mil. Spec. MIL-DTL-2212H dated 10 February 1997. Commercial-Off-The-Shelf (COTS) components maybe used provided provisions are taken to meet the qualification requirement contained in this statement of work document. These components shall meet the requirements of IEEE 45 and NEMA ICS 1, ICS 2, ICS 3.1 and ICS 4 as applicable. The control panel shall be prewired to the maximum extent possible and contain the devices necessary to operate the RO unit.

3.20.3.2 Enclosures

All electrical enclosures shall be totally enclosed, drip proof (15 degrees protected) in accordance with Mil. Spec. MIL-E-2036D dated 10 March 1988. Enclosures for commercial components requiring fan cooling shall be spray tight as defined by NEMA 250.

3.20.3.3 Logic Controller

A PLC shall be provided to automatically control the RO unit. A means for overriding and manually operating the system shall be provided. The PLC and HMI program shall be maintained in EPROM memory device for each component that will allow the component to be replaced and re-booted with the required operating program without the need to accomplish any programming steps.

3.20.3.4 Dielectric Strength

Insulation between any pair of mutually insulated electrical circuits or between any electrical terminal and the unit's frame/base shall withstand the following conditions:

- a. Insulation resistance not less than 10 megohms with 500 plus 50 Vdc applied.
- b. 60 Hz dielectric voltage of 1,500 volts rms or twice the rated voltage plus 1,000 volts rms, whichever is greater, for one minute without any arcing, sparking, or current leakage in excess of 10 millamperes.

3.20.3.5 Insulation Resistance

The insulation resistance of all electrical components shall have a minimum value of 10 megohms at 25 degrees C.

3.20.3.6 Mechanical Indexing

Mating lines, cables, and connections shall have mechanical indexing features to prevent improper connection. Wiring markings and indexing shall correspond to the manufacturer's applicable diagrams.

3.20.3.7 Grounding

Grounding of equipment shall meet the requirements of MIL-STD-1310G dated 28 June 1996.

3.20.4 Conductivity System

Salinity indicating and controlling equipment shall meet the conformance test requirements (see para. 4.5.16).

3.20.5 Elapsed-Time Meter

This item shall be provided to measure total hours of HP pump operation. No manual reset feature is permitted.

3.21 Technical Manuals

Enclosed with each delivered RO Unit shall be technical manuals and operational documentation with any addenda or attachments necessary to meet the requirements of sections 3.21.1 through 3.21.8. Two bound hard copies and two electronic copies of the technical manuals and operational documentation shall be provided for the RO system.

3.21.1 General. The manual shall precisely reflect the configuration of the RO Unit. The manual shall consist of all data (volumes, folders, inserts, specification sheets, and other documents) required for the operation and maintenance of the RO System.

3.21.2 Safety. The manual shall contain appropriate warnings, cautions, and notes.

3.21.3 Illustrations. The manual shall contain illustrations to support the text. Illustrations shall be suitable for locating and identifying all components. Illustrations shall be prescreened, sharp, and with good contrast. Illustrations shall be line drawings or photographs. Line drawings are preferred over photographs. Illustrations shall not be free hand sketches.

3.21.4 Preparation for use. The manual shall contain instructions for unpacking, assembling, and readying for operation.

3.21.5 Operation. Operating instructions shall include the principles of operation; illustrations and explanation of the uses and functions of all controls and indicators; initial set up; initial settings; and start up, normal operation, calibration, shutdown, and emergency shut down procedures.

3.21.6 Maintenance. The manual shall include the manufacturer's maintenance required for the RO Unit and shall be delineated such that it can be applied by the intended Government user. The manual shall include planned and corrective maintenance and overhaul procedures with lists of required test equipment, special tools and materials. Procedures to recognize and deal with sensor saturation shall be included. The nomenclature, part/model number and materials shall be included. Diagnostic tests and tests to ensure satisfactory performance shall be detailed.

3.21.7 Troubleshooting. The manual shall include troubleshooting procedures for all possible failure modes. The procedures shall include a description of the trouble, a possible cause, and a remedy. The Remedy shall either provide the corrective action or refer the user to the section in the manual, which provides the corrective action.

3.21.8 Parts list, illustrations and diagrams. The manual shall include a parts list, which identifies all parts of the system. The parts list shall include the actual manufacturer or vendor name, the part number, and a generic description necessary to obtain replacement parts. Clear and legible illustrations shall identify all component parts and parts relationships. Electrical point to point wiring diagrams with wire numbers shall be provided. System diagrams shall be included as necessary.

3.22 Provisioning Data

Provisioning data shall be provided for the first production RO system in the contractor's format. All lines, symbols, letters and numerals shall be readable and in accordance with industry standard.

3.22.1 Provisioning Technical Documentation

The provisioning documentation shall include all user replaceable parts and shall include a breakdown of the unit's assemblies and sub-assemblies down to the individual replaceable parts.

3.22.2 Provisioning parts list

The provisioning parts list shall include piece part information on all user replaceable parts. CAGE and part number information shall be for the actual manufacturer of the complete finished part as used in the RO System. Data required for each item as follows:

- a. Manufacturer's CAGE
- b. Manufacturer's Part Number
- c. Nomenclature
- d. Unit Price
- e. Remarks (mandatory change-out or other part information)

3.22.3 Supplementary provisioning technical documentation

Supplementary provisioning technical documentation shall be provided for each item on the provisioning parts list. Supplementary provisioning technical documentation is technical data used to describe parts of equipment. It consists of specifications, standards, drawings, photographs, sketches, descriptions, assembly and arrangement drawings, schematic diagrams, wiring and cabling diagrams needed to indicate the physical characteristic, actions and function of the item. Supplementary provisioning technical documentation shall be provided in the following order of precedence:

- a. Government or recognized industry specifications or standards (identification only, copies are not required).
- b. Commercial drawings.
- c. Commercial catalogs or catalog description.
- d. Sketches or photographs with brief descriptions of dimensional, material, mechanical, electrical, or other descriptive characteristics. When sketches or photographs are provided for an assembly, a parts list shall also be provided.

3.23 Drawings

Drawings shall be prepared in accordance with ASME Y14.1, Y14.2M, Y14.3M, and Y14.5M and all text written in the English language. All drawings shall be completely legible and suitable for microfilming/reproduction.

3.23.1 Types of Drawings

The following types of drawings shall be prepared.

3.23.1.1 Outline Drawing

An external arrangement drawing shall be prepared that shows all necessary external views of the RO unit and shall include the center of gravity, weight (dry and operating), and all external dimensions required for reproduction of ship's machinery arrangement drawings. These drawings shall provide guidance to the shipyard in designing the foundation structure for installing the unit. It shall show connection of the unit to the external piping including chemical cleaning, vents, and drains. The drawing shall show the space required for removing and replacing membranes and filter elements. All lifting lugs or eyebolts and their dimensional openings shall be shown on the drawing.

3.23.1.2 Assembly Drawing

A drawing showing completed longitudinal and transverse cross-sectional views of the RO unit shall be prepared that depicts the relationship of all parts, components, and arrangement of membranes in their housings. The Top Assembly drawing shall identify by correspondence number and date, the acceptance for Navy shock, vibration, and EMI testing, where applicable. Liberal use of enlarged views or sections shall be made. Subassembly drawings conforming to the above shall be furnished to aid in the clarity of individual components. The drawings shall be such that a thorough understanding of the design material selection and construction of the apparatus may be obtained without reference to related detailed drawings.

3.23.1.2.1 List of Materials

The assembly drawing shall contain a list of materials showing the names of parts with identifying numbers and materials of all parts. The identifying numbers shall also be shown adjacent to the part shown in the various views, with arrows pointing to the parts. Each item shall be easily located with a find number in a minimum of two views.

3.23.1.3 Detailed Drawings

Component arrangement and sectional drawings shall contain sufficient information that discloses a design approach suitable to support the manufacture of a production prototype and lists all of the component parts and material specifications. The drawings shall be completely dimensioned, with finishes and welding symbols indicated as required for manufacture.

3.23.1.4 Diagrammatic Drawings

The diagrammatic piping arrangement drawing (Process and Instrumentation and Flow diagrams) shall show the complete piping required for operating the RO unit. Piping furnished with the unit and piping furnished by the Contractor shall be clearly indicated. Location of gages, thermometers, valves, orifice plates, chemical cleaning connections, and salinity indicators shall be indicated. The drawing shall also indicate pipe size, orifice size, flow rates, flow directions, relief valve setpoints, pressure at the various points, shipyard maximum back-pressure requirements, minimum supply pressure, and all operating parameters at terminal points. The actual location of each instrument connection and component shall be the same as that on the assembly drawings. The symbols used shall be in accordance with ASTM F1000.

3.23.1.5 Wiring Drawings

Wiring assembly drawings showing terminal connections shall be provided for all electrical components furnished with the RO unit.

3.23.1.5.1 Electrical Drawings

The electrical drawings shall consist of separate schematic (elementary) and connection (point-to-point wiring) diagrams to clarify the control functions and simplify the wiring.

3.23.1.5.2 Legends

Standard legends and symbols specified in ANSI 315A shall be used on all electrical drawings.

3.23.1.6 Data

The following data shall be prepared:

- a. Range of velocities of seawater, brine, and freshwater in various portions of the system over the range of operating conditions.
- b. Desalination plant capacity curves shall be prepared for the following temperatures and salinity's: 40 degrees F, 60 degrees F, 75 degrees F, 77 degrees F, 95 degrees F, and 104 degrees F at 35,000 ppm TDS, 40,000 ppm TDS and 45,000 ppm TDS.
- c. Hydrostatic test pressure for the low and high pressure sub-systems and all similar pertinent design data.
- d. A drawing list tabulation with columns for drawing title, manufacturer's drawing number, and revision symbol. This list shall include all equipment drawings that constitute the design. The revision symbol column shall be kept up to date to the time of manufacture so that it will indicate for each drawing the revision applicable to the equipment as built.
- e. List of recommended onboard repair parts and quantities recommended.
- f. Any prior approved procuring activity deviations.
- g. Vibration, EMI, and electric interface testing.
- h. Certificates of Compliance for materials used in critical components such as HP pump, relief valves, flow meters, high pressure piping, valves and fittings, pulsation dampener, and pressure vessels.

3.23.1.7 Purpose of Drawings

Sufficient drawings shall be prepared to:

- a. Provide design information to ensure conformance to requirements of this specification, including compatibility with ship and ship systems.
- b. Evaluate performance and maintenance capability.
- c. Enable shipyard installation without contractor's assistance.
- d. Enable naval ship and shore activities to repair and maintain the item without assistance from the original contractor.

3.23.1.8 Final Drawings

Final submitted drawings and associated lists shall be to the level that provides engineering definition sufficiently complete to support the purposes listed above without resorting to additional product design effort, additional design data, or recourse to the original design activity, and the specific requirements in this specification. As-built dimensional drawings shall be submitted with each unit.

3.24 Reliability Definitions

3.24.1 Corrective Maintenance

All actions performed as a result of failure, to restore an item to a specified condition. Corrective maintenance can include any or all of the

following steps: Localization, Isolation, Disassembly, Interchange, Reassembly, Alignment, and Checkout.

3.24.2 Preventative Maintenance

All actions performed in an attempt to retain an item in specified condition by providing systematic inspection, detection, and prevention of incipient failures.

3.24.3 Mean-Time-Between-Failure (MTBF)

A basic measure of reliability for repairable items: The mean number of life units during which all parts of the item perform within their specified limits thereby permitting the unit to meet mission function, during a particular measurement interval under stated conditions.

3.24.4 Operational availability (A_o)

A measure of the degree to which an item is in an operable and committable state at the start of a mission when the mission is called for at an unknown (random) time.

3.24.5 Unit Design Life

The number of design life units from manufacture to when the item has an unrepairable failure or unacceptable failure rate.

3.24.6 Mean-Time-To-Repair (MTTR)

A basic measure of maintainability: The sum of corrective maintenance times for any specific repair, divided by the total number of failures within an item for that specific repair, during a particular interval under stated conditions.

3.24.7 Maximum Time To Repair (M_{maxct})

The maximum time to perform corrective maintenance for any specific repair.

3.24.8 Mean Preventative Maintenance Time (M_{pt})

The sum of preventative maintenance times for any specific maintenance item, divided by the total number of preventative maintenance items for that specific item, during a particular interval under stated conditions.

3.24.9 Maximum Preventative Maintenance Time (M_{maxpt})

The maximum time to perform preventative maintenance for any specific maintenance item.

3.24.10 Mean Maintenance Time

The measure of item maintainability taking into account maintenance policy. The sum of preventative and corrective maintenance times, divided by the sum of scheduled and unscheduled maintenance events, during a stated period of time.

4.0 QUALITY ASSURANCE PROVISION

4.1 Responsibility for Inspection

Unless otherwise specified in the contract, the Contractor is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract, the Contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein. NSWC reserves the right to perform any of the inspections set forth in the contract where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements. Any inspections performed by NSWC shall not relieve the Contractor of its

responsibility for quality assurance and for providing RO units, which conform to the contract requirements.

4.1.1 Quality Program Requirements

The Contractor shall provide and maintain a quality system that, as a minimum, adheres to the requirements of either Mil. Spec. MIL-I-45208A dated 20 September 1995 or ANSI/ISO/ASQC Q9001-1994 or ANSI/ISO/ASQC Q9002-1994 and supplemental requirements imposed by the resultant contract. Conformance with these requirements shall not be construed as relieving the Contractor of final responsibility to furnish equipment and services meeting specification requirements. Utilization of a material review board requires the written approval of NSWC.

4.2 Classifications of Inspections

The inspection requirements specified herein are classified as follows:

- a. First article inspection (see para. 4.3).
- b. Conformance inspection (see para. 4.4).

4.3 First Article Inspection

First article inspection shall consist of examinations and tests specified in Table III. For designs not previously approved for U.S. Navy shipboard use, a design review meeting shall be held prior to initial manufacturing of the unit to evaluate the design and review the calculations and analysis for the RO unit. This design review meeting does not absolve the manufacturer of responsibility for meeting the requirements of this specification. Unless the Navy has previously qualified the unit being offered for production, a 45-day (2160-hour) qualification test shall be conducted on full density natural seawater to demonstrate the unit's ability to meet the requirements for performance, reliability, and endurance. A procedure for this test shall be submitted to NSWC for review and approval 20 days prior to commencement of the test.

4.4 Conformance Inspection

Conformance inspection shall be performed on all RO units prior to delivery and shall consist of applicable examinations and tests specified in Table IV.

4.5 Examination Tests

The RO unit shall be examined and tested for compliance with the requirements specified in Section 3. Any necessary redesign or modification following failure to meet the specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Where possible, pressure boundary welds for both freshwater and seawater service shall be examined to verify that the welds are free of crevices, notches, porosity and pockets. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection. The RO unit shall be checked (by the procuring activity representative) with respect to material, finish, construction, assembly, dimensions, weight, and marking of identification and description plates. For conformance inspections (see para. 4.4), this examination shall be limited to those inspections that can be performed without disassembling the unit in such a manner that its performance, durability, or appearance would be affected. The completed RO unit shall be examined to ensure that the required controls, indicators, valves, electrical equipment and other components are installed. Parallel or combined testing is permitted, provided the intent of any test is not compromised.

4.5.1 45 Day Qualification Testing

For new RO system designs and vendor first-article testing, a 45-day test on natural seawater is required (see para. 4.3). Test shall be conducted by a NSWC approved independent, certified test facility. For this test, a single 1,200 GPD RO unit shall be operated continuously (or as nearly so as practical) for 45 days using natural, full-density seawater of 32,000 ppm \pm 4000 ppm TDS with a 15 minute SDI of at least 6.0. A closed loop test facility is prohibited for this test. A means shall be provided for operating the RO unit at feedwater temperatures between 75 to 104 degrees F and 45,000 ppm \pm 2000 ppm TDS to demonstrate its ability to meet the capacity and salinity required in para. 3.3. This operating range test shall be accomplished at the beginning of the 45 day test and at the end. A portion of the brine and permeate maybe re-circulated for this portion of the test. Performance shall be within the requirements listed in para. 3.3. Additionally, at least one hour of testing shall be conducted at 60 degrees F, plus or minus 3 degrees F, seawater feed temperatures. It shall be demonstrated that the capacity over the specified period of operation is not less than the specified rated capacity at minimum inlet temperature and conditions specified in para. 3.3.1.1. Operational requirements of para. 3.4 and membrane flux density (see para. 3.19.13) shall be demonstrated. There shall be no more than a 15 percent reduction in normalized production rate between the start and completion of the test. Normalization shall be determined in accordance with ASTM D4516 to standard conditions. Standard permeate pressure shall be assumed to be 15 psig. Permeate water quality shall meet the requirements of para. 3.3.4 at all times during the test, based on 45,000 ppm feed water (see para. 4.5.3). There shall be no more than a 15 percent increase in permeate salinity (ppm TDS) over the course of this test. Membrane data and analysis shall be utilized to verify the capability of the unit to meet production under the fouled condition. The accuracy of the salinity monitoring system shall be demonstrated during this test.

4.5.1.1 Pre-test

Prior to the start of the qualification test, all safety and mechanical systems and devices shall be verified to be in proper working order. All components, instruments, monitoring, controls, and flow measurement devices shall be functional and calibrated.

4.5.1.2 Data Recording

Prior to the start of the 45 day test and again at the completion of the test, dimensions shall be measured and recorded for key wearing components in the pumps. Similarly, an internal visual examination shall be made of the brine throttling device before and after the test. Initial readings shall also be recorded for pressures, temperatures, flows, feedwater pH, salinity (seawater feed, brine, and permeate) and pump leakage rate. The manufacturer is encouraged to recommend other readings that shall be monitored. Unit shutdowns shall only be permitted for routine maintenance such as changing pump oil. The time required for performing all maintenance and repairs during this test shall be recorded. The test shall be extended to make up for the downtime for repairs until the full 45 day first article test has been completed. In the event repair and maintenance times exceed the limitations specified in para. 3.7, the test will be considered unsuccessful. At set intervals during the test, the SDI values for the seawater feed and the water exiting the filters shall be measured to demonstrate that the filters provide filtrate having a 15 minute SDI of 5.0 or less for the duration of the test.

4.5.1.3 Post-test Examination and Report

A post test examination shall be performed to determine if any internal corrosion (see para. 3.16), damage or paint deterioration (see para. 4.6) has occurred that would prove detrimental to the specified (see para. 3.3.5)

service life of the RO unit. Seawater pipes (including hoses) and boundaries that can be disassembled shall be opened and examined for corrosion (degradation) and pitting (see para. 3.16). Representative sections of flanged high and low pressure piping, system valves membrane pressure vessels, and pretreatment system pressure vessels shall be inspected. Record these results, along with the results of the pump and throttling device inspections specified in para. 4.5.1.2.

TABLE III.- FIRST ARTICLE INSPECTION

FIRST ARTICLE EXAMINATION OR TEST	REQUIREMENT	EXAMINATION/ TEST	PROCEDURES
Design review	1.4, 3.0	4.3	
Characteristics			
Envelope size, (including maintenance access)	3.1	4.5	
Terminal locations	3.1.1	4.5	
System requirements	3.1.2	4.5	
Controls and indicators	3.5	4.5	4.5.1.1
Salinity indicating system	3.5.2	4.5	4.5.16/17
Interchangeability	3.9	4.5	
Identification plates	3.15, 3.20.3.6	4.5	
Materials	3.16	4.5	4.5.1.2
Fabrication	3.17	4.5.11, 4.5.12	4.5.11
Frames and bedplates	3.17.4	4.5	
Paint	3.17.6	4.5, 4.6	
Safety	3.18	4.5	
Components	3.19	4.5	
Electrical equipment	3.20	4.5	4.5.1.1
Performance			
45 day qualification	3.2.1, 3.16	4.5.1	4.5.1
Permeate production rate	3.3.1.1	4.5.1	
Permeate water quality	3.3.4	4.5.3	
Operation			
Normal operation	3.4.1	4.5.1	
Monitoring	3.4.2	4.5.16, 4.5.17	
Start-up/shutdown	3.4.3	4.5.1	
Cleaning	3.4.4	4.5	
Energy consumption	3.4.5	4.5.2	
Electric controls	3.5, 3.20.3	4.5	4.5.1.1
Preventative maintenance and repair	3.6	4.5.9	4.5.9
Reliability	3.7	4.5.10	
Hydrostatic pressure	3.8	4.5.5	4.5.5
Electromagnetic interference	3.10	4.5.15	4.5.15
Vibration	3.12	4.5.7	4.5.7
Ship attitude or motion	3.13	4.5	
Components			
Filters	3.19.6	4.5.1.3	4.5.1
Flow measurement	3.19.17, 3.19.18	4.5.1.3	
Electrical equipment			
Dielectric strength	3.20.3.4	4.5.13	4.5.13
Insulation resistance	3.20.3.5	4.5.14	4.5.14
Electric power system interface	3.20.3	4.5.18	4.5.18

TABLE IV.- CONFORMANCE INSPECTION

EXAMINATION OR TEST	REQUIREMENT	QUALITY CONFORMANCE TEST	PROCEDURES
Characteristics			
Terminal points	3.1.1	4.5	
Identification plates	3.15, 3.20.3.6	4.5	
Safety	3.18	4.5	
Components	3.19	4.5	
Performance			
8-hour performance	3.2.2	4.5.4	4.5.4
Permeate flow rate indication	3.3.1.1	4.5.4	
Salinity indicating System	3.5.2	4.5.16, 4.5.17	4.5.4 4.5.17.2
Hydrostatic test	3.8	4.5.5	4.5.5
Electrical equipment			
Dielectric strength	3.20.3.4	4.5.13	4.5.13
Insulation resistance	3.20.3.5	4.5.14	4.5.14

4.5.1.4 Post Test

At the conclusion of the qualification testing (see para. 4.5.1), flush the unit with freshwater, remove the RO membrane test elements and filter media, drain and dry the RO unit. A new set of RO membrane elements still in their original packing shall be shipped with the unit. These shall not be installed until the RO unit is ready for operation. The test RO membrane elements may be reused for subsequent testing of other units if they are properly preserved and stored between tests.

4.5.1.5 Acceptance Criteria

To pass the 45-day operational test, no major component shall cause the RO unit to fail to provide acceptable permeate at any time during the testing (see paras. 3.3.4 and 4.5.1). There shall be no indications of general corrosion that results in a wall loss greater than 1 mil internal to the unit. Localized crevice corrosion over 2 mils wide and pits in excess of 15 mils deep will also constitute failure. External surface oxidation or rust of painted components or unit frame shall not exceed 1 square inch per any square foot area of the assembly. For the purpose of this test, major components are defined as:

- a. Centrifugal separator (if used)
- b. Filters and housings
- c. High pressure pump and motor
- d. RO membranes and pressure vessels
- f. Brine throttling device
- g. Flowmeters
- h. Accumulator/pulsation dampener
- i. Salinity monitoring and dumping system
- j. Strainer
- k. Controls

4.5.2 Energy Consumption

The RO unit shall be tested to determine maximum power required for operation (see para. 3.4.5). Maximum power is defined to include all electric components operating at maximum load.

4.5.3 Permeate Water Quality

The permeate water quality shall meet the requirements specified in para. 3.3.4 when operating with full-density natural seawater. The salinity content

shall be tested using the salinity indicating equipment installed on the unit. For first article inspection, the salinity content shall be verified, both at the beginning and at the end of the tests, by an independent, certified laboratory. The test for chloride ions shall be in accordance with ASTM D512.

4.5.4 8-hour Operational Test

An operational test shall be conducted on each production RO unit offered for delivery. Prior to the start of the qualification test, all safety and mechanical systems and devices shall be verified to be in proper working order. All components, instruments, monitoring, controls, and flow measurement devices shall be functional and calibrated. Each unit shall be operated for 8-hours continuously with membrane simulators installed that are sized to allow the unit to operate at the maximum design operating pressures. The salinity content of feedwater shall not exceed that specified in para. 3.3.4 for the final permeate. All components and controls shall be functional during the entire test. The accuracy of the salinity monitoring system shall be demonstrated during this test.

4.5.4.1 Post Test

After the 8-hour test, flush the unit with freshwater, remove the RO membrane simulators and cartridge filters, drain and dry the RO unit. A new set of RO membrane elements and pre-filter media, still in their original packing, shall be shipped with the unit. The membranes will not be installed until the RO unit is ready for operation.

4.5.4.2 Acceptance Criteria

The acceptance criteria for the 8-hour operational test shall be that no major component causes the RO unit to fail to provide acceptable permeate at required capacity during the 8-hour run (see para. 3.3.4). Major components are the same as those listed in para. 4.5.1.5. Minor components such as pressure and temperature gages and switches, valves, relief valves, and hoses may be repaired during this test. The test shall then be extended to make up for the downtime for repairs until the full 8-hour operation has been successfully completed.

4.5.5 Hydrostatic Pressure

The RO unit, except membranes and filter elements, shall be subjected to a hydrostatic pressure test of 1-1/2 times the design pressure (50 psig minimum). Test pressure shall be successfully held for 30 minutes before visual inspection. There shall be zero leakage in all areas except at the pump packing, where applicable.

4.5.6 Not Used

4.5.7 Vibration

The assembled RO system shall meet the vibration requirements specified in 3.12 and shall be tested in accordance with MIL-STD-167/1 dated 19 June 1987. More than three interruptions during the endurance portion of the test, in any one axis, will require retesting after the problem has been resolved. The RO unit shall be operational during testing using synthetic, full-density feedwater at rated capacity. After the vibration test, a 4-hour performance test shall be performed. Reciprocating type high pressure pumps (if used) shall also be analyzed and tested for Type III torsional vibration in accordance with MIL-STD-167/2.

4.5.8 Not Used

4.5.9 Maintainability

The RO system shall meet the requirements for maintenance and repair as specified in para. 3.6. The manufacturer shall demonstrate, as part of the

first article testing, the maintenance procedures and removal of parts from the unit for repair and the time required for accomplishment.

4.5.10 Reliability

The RO system shall meet the requirements of para. 3.7.

4.5.11 Data Collection, Analysis and Corrective Action

R&M Data Collection, Analysis and Corrective Action (DCACA) program shall be performed. The R&M DCACA program includes the Failure Reporting, Analysis and Corrective Action System (FRACAS) in accordance with MIL-STD-785B dated 3 July 1986, Task 104 and the DCACA program in accordance with MIL-STD-470A dated 26 August 1987, Task 104. The R&M DCACA Program applies to all equipment procured by this statement of work document. The DCACA program shall commence when an equipment undergoes any test activity and shall continue through final RO unit acceptance. The R&M DCACA program shall include:

a. Documentation of all malfunctions according to the following definition: Malfunction event - an event in which an item does not perform its intended function, regardless of impact on equipment or system performance or the method and duration of restoration.

b. Analysis of each malfunction or technical problem with emphasis on pattern malfunctions to include identification of repaired, replaced or adjusted item, circumstances surrounding the malfunction, malfunction symptoms, and probable cause of malfunction.

c. Classification of malfunction events as failures or non-failures according to the following definitions: **Failure** - any malfunction or combination of malfunctions that prevents an equipment or system from operating in one or more modes of operation in accordance with the performance requirements. **Non-failure** - any malfunction or combination of malfunctions that is not classified as a failure shall be classified as a non-failure.

d. Classification of failure based on its relevancy. Relevant and non-relevant failure definitions shall be as specified in MIL-STD-781D dated 17 October 1986, paragraph 4.7, modified as follows:

- (1) Add the following typical relevant failures to para. 4.7.1:
 - Design defects
 - Manufacturing defects
 - Parts defects
 - Unknown
 - All other categories not specifically listed as non-relevant
- (2) Add the following typical nonrelevant failures to para. 4.7.2:
 - Accidents, mishandling, or improper storage after installation check-out.
 - Operator or procedural error (provided documentation errors are promptly corrected and verified by the Supplier).
 - Installation or maintenance errors due to drawing error implementation (provided documentation errors are promptly corrected and verified by the Supplier).
- (3) In addition to the above classification criteria, the following requirements apply to para. 4.7.1:
 - Failure due to wrong or missing parts is relevant unless clearly in a non-relevant definition.
 - A transient failure, which is non-repetitive and does not require repair, is non-relevant. The second such failure and any additional failures of this type shall be considered relevant.

Failure of a serial or redundant item, as the direct result of failure of another serial item, is non-relevant. However, a failure of a redundant item that causes failure of a series item or the entire redundant function shall be considered a relevant failure. Failures are not multiple unless they are independent.

e. Statement for each malfunction of the immediate corrective action and recommendation, if different, for permanent corrective action.

f. Verification that corrective action has been implemented in applicable source control drawings, maintenance manuals, and other technical data.

g. Analysis of maintainability problems to determine required corrective actions, such as, equipment design change to improve accessibility, repair time, frequency of failure, or documentation.

h. The Contractor shall participate in a Buyer's failure review board.

i. Failure Summary reports and DCACA Reports shall be prepared.

4.5.12 Welding Inspection

All stages of welding and brazing shall be subject to full-time inspection by the procuring activity representative to ensure manufacturer compliance with the requirements of publication, NAVSEA S9074-AR-GIB-010/278 and ASME Section IX. Such inspection shall not relieve manufacturer of his responsibility to provide quality materials and workmanship. Butt-welded pressure boundaries with design pressure over 300 psig shall receive radiograph inspection in accordance with publication, NAVSEA S9074-AR-GIB-010/278. All welded seam high pressure seawater or brine piping shall be 100 percent Radiographic Test (RT) inspected and approved in accordance with publication, NAVSEA T9074-AS-GIB-010/271. Repairs to any pressure boundary shall be in accordance with publication, NAVSEA S9074-AR-GIB-010/278 and shall be accomplished following purchaser approval. Subsequent non-destructive testing (NDT) shall be to publication, NAVSEA T9074-AS-GIB-010/271 requirements.

4.5.13 Dielectric Strength

The RO unit shall be tested to verify that the dielectric strength requirements of para. 3.20.3.4 have been satisfied.

4.5.14 Insulation Resistance

The RO unit shall be tested to verify that the insulation resistance requirements of para. 3.20.3.5 have been satisfied.

4.5.15 Electromagnetic Interference (EMI)

The first article RO unit shall be tested to verify the unit meets the EMI emission and susceptibility requirements of MIL-STD-461E dated 20 August 1999 for surface ship equipment mounted below deck.

4.5.16 Salinity Indicating System

The following tests are required on the first article RO unit to determine whether the accuracy of para. 3.5.2.9 is met. Conductivity indicating systems previously qualified in accordance with Mil. Spec. MIL-S-15103 for shipboard use do not require testing.

4.5.16.1 Salinity Monitor

Simulated input to the sensor terminals of the salinity monitor shall be provided (either by decade boxes or some other means). The salinity meter shall be used to monitor the channel being tested. Salinity remote alarm and remote readout shall be monitored. Dump valve or the equivalent electrical load shall be connected to dump output terminals. Salinity monitor calibration shall be performed by inputting the appropriate resistance values. All of the data points shall be inputted to each salinity channel to verify that the

accuracy of the salinity monitor is as specified in para. 3.5.2.9. In addition, nine data points [three conductivity levels (10, 25, 100 or 250, 100, 2000 micromhos/cm) at three temperatures (40, 90, 105 degrees F) for each shall be inputted to each of the remaining salinity channels to verify salinity monitor accuracy. Accuracy of salinity alarm and remote alarm and dump alarm for each salinity channel shall be verified to be as specified in para. 3.5.2.9 by simulating a fixed temperature and slowly increasing the simulated conductivity until alarm actuation occurs.

4.5.16.2 Sensor Constant

The sensor constant shall be verified using the procedure specified in Method A of ASTM D1125.

4.5.16.2.1 Sensor Temperature Compensator Response

In order to determine the response of the temperature compensator to changes in fluid temperature, three distilled water baths shall be set up at the following temperatures 75 degrees F \pm 5 degrees F, 125 degrees F \pm 5 degrees F, 175 degrees F \pm 5 degrees F. The baths shall be of sufficient volume that the temperatures will not be significantly affected by the immersion of the sensors as specified hereinafter. The temperature compensator leads shall be connected to an ohmmeter. The sensor shall be immersed in the 75 degrees F bath for at least 5 minutes and a resistance shall be taken. The sensor shall then be quickly transferred (in approximately 1 second) to the 125 degrees F bath. Using a stopwatch, resistance readings shall be taken every 10 seconds for approximately 1 minute or until readings begin to stabilize and thereafter readings shall be taken every 30 seconds until readings are completely stabilized. The above mentioned procedure shall be repeated with the sensor being transferred from the 125 degrees F bath to the 175 degrees F bath, from the 175 degrees F bath to the 125 degrees F bath, and from the 125 degrees F bath to the 75 degrees F bath. Response of the sensor temperature compensator resistance to step changes in temperature shall be as specified in para. 3.5.2.10.

4.5.16.3 System Accuracy (using test solution)

In order to determine system accuracy, sensors (having passed the sensor constant test of para. 4.5.15.2 and the sensor temperature compensator test of para. 4.5.15.2.1) shall be connected to a salinity monitor (which has passed the salinity monitor accuracy test of para. 4.5.15.1). Remote alarms, remote readouts, and dump shall be monitored as specified in para. 4.5.15.1. Sensor and valve assemblies shall be installed. Solution temperature, solution concentration and pressure shall be monitored by reference instruments throughout the testing. System accuracy of salinity monitor readouts and alarms shall be as specified in para. 3.5.2.9. Data tables shall include a tabulation of reference instruments, local and remote salinity meters, limits of error, and alarm actuation points. In the first sequence, solution temperature shall be maintained at 77 degrees F \pm 1 degrees F for the duration of the test sequence while the solution concentration is increased in steps. Test points shall cover the full meter range. At least two of the test points shall be alarm actuation points. Each test point value shall be maintained for at least 5 minutes. At each test point, comparative readings shall be taken for all channels of local and remote salinity meters, as well as the reference instruments. In addition, alarms and dump shall be observed for correct actuation. In the second sequence, the solution concentration shall be maintained at a value within the range of the particular salinity meter. While holding the concentration constant, the temperature of the solution shall be varied over the following points: 40 degrees F, 77 degrees F, 100 degrees F, 150 degrees F, and 200 degrees F. The tolerance for each temperature shall be plus or minus 1 degrees F. Each test point shall be maintained for at least 5 minutes. At each test point, comparative readings shall be taken for all

channels on local and remote salinity meters, as well as the reference instruments.

4.5.16.4 Overrange (sensor short circuit)

The salinity indicating equipment shall be set up as specified in 4.5.15.3, except that the sensor shall not be immersed in a bath. A short circuit shall be applied across the electrode of each sensor, one at a time, for 5 minutes each. Following the application of short circuits, the equipment shall be subjected to the system accuracy test specified in para. 4.5.15.3. Performance of the salinity monitor shall be as specified in paras. 3.5.2.9 and 3.5.2.11.

4.5.17 Dumping System

The dumping system shall be tested for cyclic operation and watertightness in accordance with paras. 4.5.17.1 and 4.5.17.2.

4.5.17.1 Cyclic Test

The dumping component shall be installed in a line supplied with freshwater at a minimum of 50 psig at 60-90 degrees F and the solenoid shall be connected to the appropriate source of electrical power. The component shall be subjected to freshwater flow for 1000 cycles of operation. During this period of operation the component shall remain watertight in both of its operating positions. A test for watertightness in accordance with para. 4.5.17.2 shall be conducted at intervals of approximately 200 cycles and at the completion of the cyclic test.

4.5.17.2 Watertightness

The component shall be subjected to a hydrostatic pressure of 100 psig to test for strength and porosity. The component shall be subjected to the leak tests that follow. Test duration shall be 30 minutes at each test condition. The component shall be vented prior to each test to ensure that no air is present. The acceptance criteria for each test shall be that no leakage be observed from the appropriate port for the duration of each test:

- a. The component in the latched position, inlet port pressurized to 50 psig, and the dump port at 0 psig.
- b. The component in the dump position, inlet port pressurized to 50 psig, and the outlet port at 0 psig.
- c. The component in the latched position, dump port pressurized to 15 psig, and the inlet port at 0 psig.

4.5.18 Electric Power Interface Testing

The first article RO unit shall be tested to verify the unit control system and high pressure pump soft start or drive meets the electric power interface requirements of MIL-STD-1399, Section 300A with Notice 1 dated 11 March 1992 for type I power systems.

4.6 Inspection of Painting Systems

All stages of painting shall be subject to full-time inspection by the procuring activity representative. Such inspection shall not relieve the manufacturer of his responsibility to provide quality materials and workmanship. Inspections shall ensure that painted surfaces are free of mechanical damage, blisters, cracks or flakes.

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D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A004		2. TITLE OF DATA ITEM STATUS REPORT			3. SUBTITLE			
4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY Monthly	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION			
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: Itemized man-hour and cost information required in para 10-2-3 is not required. BLOCK 8: Review for technical content: Allow 10 working days for Government review. Contractor shall incorporate all government comments and corrections and shall resubmit within 5 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit draft no more than 30 days following contact award. BLOCK 13: Submit Monthly through until first article testing is completed and then quarterly when fabricating production units. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor shall use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1		1
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D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR		
1. DATA ITEM NO. A006		2. TITLE OF DATA ITEM WELDING PROCEDURES			3. SUBTITLE		
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80875			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232		
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION			
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16. REMARKS BLOCK 4: Section 7, Replace "by 4.2.1 of MIL-STD-248D" with "in section 4 of NAVSEA Technical Manual S9074-AQ-GIB-010/248. BLOCK 4: Section 10, Replace MIL-STD-248D with NAVSEA Technical Manual S9074-AQ-GIB-010/248. BLOCK 8: Review for technical content: Allow 24 calendar days for Government review. Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review maybe tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 30 days after contract award. Unit fabrication prior to weld procedure approval is at contractors risk. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083			NSWCCD Code 9232		1	2	
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D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.			F. CONTRACTOR				
1. DATA ITEM NO. A007		2. TITLE OF DATA ITEM WELDING PROCEDURE QUALIFICATION TEST REPORT			3. SUBTITLE					
4. AUTHORITY (Data Acquisition Document No.) DI-MISC-80876				5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232				
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1. DATA ITEM NO. A008		2. TITLE OF DATA ITEM NOTIFICATION OF TESTS			3. SUBTITLE								
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1. DATA ITEM NO. A009		2. TITLE OF DATA ITEM COMMERCIAL DRAWINGS AND ASSOCIATED LISTS						3. SUBTITLE PRELIMINARY 1,200 GPD RO SYSTEM							
4. AUTHORITY (Data Acquisition Document No.) DI-DRPR-813003A				5. CONTRACT REFERENCE				6. REQUIRING OFFICE NSWCCD, Code 9232							
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY ONE TIME		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION							
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D. SYSTEM/ITEM RO DESALINATION SYSTEM				E. CONTRACT/PR NO.				F. CONTRACTOR					
1. DATA ITEM NO. A010		2. TITLE OF DATA ITEM COMMERCIAL DRAWINGS AND ASSOCIATED LISTS						3. SUBTITLE FINAL 1,200 GPD RO SYSTEM					
4. AUTHORITY (Data Acquisition Document No.) DI-DRPR-813003A				5. CONTRACT REFERENCE				6. REQUIRING OFFICE NSWCCD, Code 9232					
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY ONE TIME		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION					
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BLOCK 12: Final drawing package shall be provided within 140 days of contract award.													
BLOCK 13: All future drawing changes made after this drawing package have been approved must be documentented with an Engineering Change Notice and approved by the Government.													
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D. SYSTEM/ITEM RO DESALINATION SYSTEM					E. CONTRACT/PR NO.					F. CONTRACTOR			
1. DATA ITEM NO.		2. TITLE OF DATA ITEM						3. SUBTITLE					
A011		INSTALLATION CONTROL DRAWINGS						1,200 GPD RO SYSTEM					
4. AUTHORITY (Data Acquisition Document No.) DI-DRPR-81242					5. CONTRACT REFERENCE					6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY ONE TIME		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION					
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Engineering Station, 5001 South Broad St, Code 9232, R.Steck,													
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Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.							
A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>PROVISIONING</u>			
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR		
1. DATA ITEM NO. A013		2. TITLE OF DATA ITEM LOGISTICS MANAGEMENT INFORMATION (LMI) DATA PRODUCTS			3. SUBTITLE PROVISIONING PARTS LIST 1,200 GPD RO SYSTEM		
4. AUTHORITY (Data Acquisition Document No.) DI-ALSS-81529			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232		
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION			
8. APP CODE A	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS			NSWCCD Code 9232		1	1	4
BLOCK 4: Provisioning Parts List (PPL) content shall also be meet the requirements specified in the PPD. Submittal shall be via ICAPS or in accordance with the ICAPS compatible format identified by PAFOS Chapter 4, Appendix K. PPL submittal shall include the data elements requirements as identified by the LMI worksheet.							
BLOCK 8: Review for technical content: Allow 14 calendar days for government review. Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review maybe tailored or deleted per any such agreement made between the Government and the Contractor.							
BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer.							
BLOCK 12: PPL Draft shall be provided within 80 days of contract award.							
BLOCK 13: Final PPL submittal shall be provided within 140 days of contract award and incorporate any changes resulting from the testing and maintainability demonstration.							
All future changes to the PPL made after the final PPL has been approved must be documented with an Engineering Change Notice and approved by the Government.							
BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083							
BLOCK 14: The Contractor shall submit this requirement via direct upload/development in ICAPS C/S, or by submitting ICAPS files/ICAPS compatible format files of compact discs or attached to electronic mail (Email).							
15. TOTAL							
G. PREPARED BY R. Steck		H. DATE		I. APPROVED BY J. Hill		J. DATE	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)										<i>Form Approved</i> <i>OMB No. 0704-0188</i>							
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A. CONTRACT LINE ITEM NO.			B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>PROVISIONING</u>												
D. SYSTEM/ITEM RO DESALINATION SYSTEM					E. CONTRACT/PR NO.					F. CONTRACTOR							
1. DATA ITEM NO. A014		2. TITLE OF DATA ITEM LOGISTICS MANAGEMENT INFORMATION (LMI) SUMMARIES						3. SUBTITLE ENGINEERING DATA FOR PROVISIONING (EDFP)(Digital) 1,200 GPD RO SYSTEM									
4. AUTHORITY (Data Acquisition Document No.) DI-ALSS-81530					5. CONTRACT REFERENCE					6. REQUIRING OFFICE NSWCCD, Code 9232							
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY ONE TIME		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION									
8. APP CODE A		11. AS OF DATE		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE				b. COPIES Draft Final Reg Repro							
16. REMARKS										NSWCCD Code 9232		1		1		4	
BLOCK 4: The Contractor shall provide EDFP in accordance with the LMI Summary for EDFP. The EDFP content shall meet the requirements specified in the PPD.																	
BLOCK 8: Review for technical content: Allow 14 calendar days for government review. Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor.																	
BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer.																	
BLOCK 12: EDFP Draft shall be provided within 80 days of contract award.																	
BLOCK 13: Final EDFP submittal shall be provided within 140 days of contract award and incorporate any changes resulting from the testing and maintainability demonstration.																	
All future changes to the EDFP made after the final EDFP has been approved must be documented with an Engineering Change Notice and approved by the Government.																	
BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083																	
BLOCK 14: The Contractor shall submit this requirement in digital format. The acceptable format for these engineering drawings are: C4 Navy CALS variant, Native CADD, or PDF. The Government will provide additional guidance at the PGC if requested.																	
15. TOTAL																	
G. PREPARED BY R. Steck					H. DATE		I. APPROVED BY J. Hill					J. DATE					

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)					Form Approved OMB No. 0704-0188		
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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>PROVISIONING</u>			
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR		
1. DATA ITEM NO. A015		2. TITLE OF DATA ITEM LOGISTICS MANAGEMENT INFORMATION (LMI) DATA PRODUCTS			3. SUBTITLE TOOLS AND TEST EQUIPMENT LIST (TTEL) 1,200 GPD RO SYSTEM		17. PRICE GROUP
4. AUTHORITY (Data Acquisition Document No.) DI-ALSS-81529			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232		18. ESTIMATED TOTAL PRICE
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION			
8. APP CODE A	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS			NSWCCD Code 9232		1	1	4
BLOCK 1: If there is no Tools and Test Equipment List (TTEL) this data item shall be deleted upon written notification to the Government Contracting Officer.							
BLOCK 4: This data item shall be provided in accordance with the data requirements and formats specified in the LMI worksheet.							
BLOCK 8: Review for technical content: Allow 14 calendar days for government review. Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review maybe tailored or deleted per any such agreement made between the Government and the Contractor.							
BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer.							
BLOCK 12: TTEL Draft shall be provided within 80 days of contract award.							
BLOCK 13: Final TTEL submittal shall be provided within 140 days of contract award and incorporate any changes resulting from the testing and maintainability demonstration.							
All future changes to the TTEL made after the final TTEL has been approved must be documented with an Engineering Change Notice and approved by the Government.							
BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083							
BLOCK 14: The Contractor shall submit this requirement via direct upload/development in ICAPS C/S, or by submitting ICAPS files/ICAPS compatible format files of compact discs or attached to electronic mail (Email).							
G. PREPARED BY R. Steck			H. DATE		I. APPROVED BY J. Hill		J. DATE
15. TOTAL							

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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>PROVISIONING</u>				
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A016		2. TITLE OF DATA ITEM PROPOSED SPARE PARTS LIST			3. SUBTITLE ONBOARD SPARES 1,200 GPD RO SYSTEM			
4. AUTHORITY (Data Acquisition Document No.) DI-ILSS-80134A		5. CONTRACT REFERENCE			6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION				
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: The Contractor shall provide recommended onboard spare parts list a 4,500 hour operating period. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review maybe tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Recommended spare parts list draft shall be provided 180 days after contract award. BLOCK 13: Final spare parts list submittal shall be provided within 140 days of contract award and incorporate any changes resulting from the testing and maintainability demonstration. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083				NSWCCD Code 9232		1	1	4
				15. TOTAL				
G. PREPARED BY R. Steck		H. DATE		I. APPROVED BY J. Hill		J. DATE		

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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>FIRST ARTICLE TEST</u>				
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A017		2. TITLE OF DATA ITEM TEST PROCEDURE			3. SUBTITLE FIRST ARTICLE 1,200 GPD RO SYSTEM			
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80603			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION				
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: The First Article Test Procedure shall support all unit inspections and detailed in the PPD that are not covered in a dedicated test plan or procedure. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 60 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review maybe tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	1
				15. TOTAL				
G. PREPARED BY R. Steck		H. DATE		I. APPROVED BY J. Hill		J. DATE		

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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>FIRST ARTICLE TEST</u>							
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR						
1. DATA ITEM NO. A018		2. TITLE OF DATA ITEM TEST/INSPECTION REPORT			3. SUBTITLE FIRST ARTICLE 1,200 GPD RO SYSTEM						
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80809B			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232						
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION							
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro					
16. REMARKS BLOCK 4: The First Article Test/Inspection report shall support all unit inspection tests detailed in the PPD that are not covered in a dedicated test plan or procedure. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 160 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	3			
				15. TOTAL							
				G. PREPARED BY R. Steck		H. DATE		I. APPROVED BY J. Hill		J. DATE	

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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>FIRST ARTICLE TEST</u>				
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A019		2. TITLE OF DATA ITEM TEST PROCEDURE			3. SUBTITLE 45 DAY QUALIFICATION TEST 1,200 GPD RO SYSTEM			
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80603		5. CONTRACT REFERENCE			6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION			
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: The First Article Test Procedure shall support the 45 day qualification detailed in the PPD. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 60 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	1
15. TOTAL								
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D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A020		2. TITLE OF DATA ITEM TEST/INSPECTION REPORT			3. SUBTITLE 45 DAY QUALIFICATION TEST 1,200 GPD RO SYSTEM			
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80809B		5. CONTRACT REFERENCE			6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION				
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: The First Article Test/Inspection report shall support the 45 day qualification test detailed in the PPD. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 160 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	3
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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>FIRST ARTICLE TEST</u>				
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A021		2. TITLE OF DATA ITEM TEST PROCEDURE			3. SUBTITLE VIBRATION TESTS 1,200 GPD RO SYSTEM			
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80603		5. CONTRACT REFERENCE			6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION			
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: The First Article Test Procedure shall support the external and internal (if required) induced vibration tests detailed in the PPD. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 80 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	1
15. TOTAL								
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D. SYSTEM/ITEM RO DESALINATION SYSTEM					E. CONTRACT/PR NO.					F. CONTRACTOR					
1. DATA ITEM NO. A022		2. TITLE OF DATA ITEM TEST/INSPECTION REPORT						3. SUBTITLE VIBRATION TESTS 1,200 GPD RO SYSTEM						17. PRICE GROUP	
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80809B					5. CONTRACT REFERENCE					6. REQUIRING OFFICE NSWCCD, Code 9232				18. ESTIMATED TOTAL PRICE	
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY ONE TIME		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION							
8. APP CODE A		See Blk 16		11. AS OF DATE		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES					
16. REMARKS BLOCK 4: The First Article Test/Inspection Report shall support the external and (if required) induced vibration tests detailed in the PPD. BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 160 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.								Draft		Final					
								Reg		Repro					
15. TOTAL								NSWCCD Code 9232		1		1		3	
G. PREPARED BY R. Steck				H. DATE		I. APPROVED BY J. Hill				J. DATE					

[illegible]

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CONTRACT DATA REQUIREMENTS LIST <i>(1 Data Item)</i>						Form Approved OMB No. 0704-0188				
Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.										
A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>FIRST ARTICLE TEST</u>						
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.			F. CONTRACTOR				
1. DATA ITEM NO. A025		2. TITLE OF DATA ITEM MAINTAINABILITY/TESTABILITY DEMONSTRATION TEST PLAN			3. SUBTITLE 1,200 GPD RO SYSTEM					
4. AUTHORITY (Data Acquisition Document N) DI-MNTY-81604				5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232				
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY ONE TIME		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION		
8. APP CODE A		11. AS OF DATE		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repr		
16. REMARKS BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 80 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review maybe tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.						NSWCCD Code 9232		1	1	1
						15. TOTAL				
G. PREPARED BY R. Steck			H. DATE		I. APPROVED BY J. Hill			J. DATE		

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Pg 25 of 31 Pages

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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>PRODUCTION TEST</u>				
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A028		2. TITLE OF DATA ITEM QUALITY CONFORMANCE INSPECTION AND TEST PROCEDURES			3. SUBTITLE PRODUCTION UNIT 1,200 GPD RO SYSTEM			
4. AUTHORITY (Data Acquisition Document No.) DI-RELI-80322			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232			
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION				
8. APP CODE A	See Blk 16	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16	a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 8: Review for technical content: Allow 14 calendar days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 90 days of contract award. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	1
15. TOTAL								
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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM- _____ OTHER <u>PRODUCTION TEST</u>				
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.		F. CONTRACTOR			
1. DATA ITEM NO. A029		2. TITLE OF DATA ITEM TEST/INSPECTION REPORT			3. SUBTITLE QUALITY CONFORMANCE INSPECTION 1,200 GPD RO SYSTEM		17. PRICE GROUP	
4. AUTHORITY (Data Acquisition Document No.) DI-NDTI-80809B			5. CONTRACT REFERENCE		6. REQUIRING OFFICE NSWCCD, Code 9232		18. ESTIMATED TOTAL PRICE	
7. DD 250 REQ DD	9. DIST STATEMENT REQUIRED	10. FREQUENCY ONE TIME	12. DATE OF FIRST SUBMISSION See Blk 16	14. DISTRIBUTION				
8. APP CODE A	11. AS OF DATE See Blk 16	13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro		
16. REMARKS BLOCK 4: The quality conformance inspection report shall provide the results of inspection and test of the production RO units. BLOCK 8: Review for technical content: Allow 15 working days for government review. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 12: Submit within 10 days of unit delivery. BLOCK 13: Contractor shall incorporate all government comments and corrections and shall resubmit within 15 days of receipt of comments. Government review may be tailored or deleted per any such agreement made between the Government and the Contractor. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083 BLOCK 14: The Contractor may use Electronic mail as the media to deliver this data item. The Government will provide Email address upon request.				NSWCCD Code 9232		1	1	3
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A. CONTRACT LINE ITEM NO.		B. EXHIBIT A		C. CATEGORY TDP _____ TM-_____ OTHER <u>TECHNICAL MANUALS</u>										
D. SYSTEM/ITEM RO DESALINATION SYSTEM			E. CONTRACT/PR NO.			F. CONTRACTOR								
1. DATA ITEM NO. A031		2. TITLE OF DATA ITEM COMMERCIAL OFF THE SHELF (COTS) MANUAL AND ASSOCIATED SUPP DATA			3. SUBTITLE 1,200 GPD RO SYSTEM PRODUCTION UNIT									
4. AUTHORITY (Data Acquisition Document No.) DI-TMSS-80527A			5. CONTRACT REFERENCE PPD			6. REQUIRING OFFICE NSWCCD, Code 9232								
7. DD 250 REQ DD		9. DIST STATEMENT REQUIRED		10. FREQUENCY See Blk 16		12. DATE OF FIRST SUBMISSION See Blk 16		14. DISTRIBUTION						
8. APP CODE		11. AS OF DATE		13. DATE OF SUBSEQUENT SUBMISSION See Blk 16		a. ADDRESSEE		b. COPIES Draft Final Reg Repro						
16. REMARKS BLOCK 10, 12, and 13: Provide two hard copies and two electronic copies of Technical Manual with each production unit delivered to the Government. BLOCK 12: Manuals shall ship with the unit, 120 days afer contract award. BLOCK 9: Distribution Statement C Applies; Distribution authorized to U.S. Government agencies and their contractors for Administrative/Operational use. Other requests for this document shall be referred to the Government Contracting Officer. BLOCK 6 and 14: Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station, 5001 South Broad St, Code 9232, R.Steck, Philadelphia PA 19112-5083						NSWCCD Code 9232				2				
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Pg 31 of 31 Pages